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THE LONDON NATURALIST

the journal of the
LONDON NATURAL HISTORY SOCIETY

Published: November 1972
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NATURAL

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LONDON NATURAL HISTORY SOCIETY

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for the year 1971

Edited by J. R. Laundon
with the assistance of
R. M. Burton and K. H. Hyatt

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Report of the Society for 1971

There has been no significant change in our overall membership since last year, new enrolments having exceeded losses by eight only. The totals of paid-up members as at 31 October 1971 are as follows:

Ordinary members	947
Affiliated members	23
Senior members	17
Family members	72
Junior members	62
Honorary members	16
Life members	19
	1,156

With deep regret we have to report the death of the following members: T. R. Eagles, J. B. Foster, Miss L. E. Johns, Miss J. Lamb, Mrs R. F. Moorman, H. M. Pratt, Miss M. A. R. S. Scholey, D. S. Warren. Obituaries of some of these members will be published in the Society's journals in recognition of the services rendered by them to the Society.

The Society has now received the monies accruing to it from the estate of the late M. T. Hindson. This amounts to £25,264·34 which has been invested for the time being. As previously reported, it is intended to use this money to secure suitable premises as a headquarters for the Society.

Discussions are currently going forward on the matter of premises, which, if successful, will leave us with the Hindson Bequest funds largely intact. If we are fortunate in this respect, then alternative uses for the funds can be decided upon. Meanwhile, it would be premature to report more at this time.

The efforts begun last year to publicise the Society and to attract new members have not, it seems, had the impact we had hoped for, although the small increase mentioned above is itself a hopeful sign, following as it does three years of falling membership. The campaign will continue and this, together with the efforts of existing members to draw more of their friends into the fold, will help us to maintain, at least, our present strength.

The Editor of the *London Naturalist*, P. A. Moxey, has found that his duties as Warden of the Epping Forest Conservation Centre at High Beach, Loughton, have left him with too little time to continue in office. Indeed, members will have been disappointed not to have received the journal for 1970, which should have been published this summer. We hope it will be published early in the New Year. We commiserate with Mr Moxey for not being able to continue his editorship, but thank him for his work in the past and wish him every success in his post at High Beach. Next year's journal (No. 51 for 1971) will be edited by J. R. Laundon aided by a team of editorial assistants and helpers.

Plans were made this year for the production of a Society Bulletin to be issued six times a year free to all members. This would embrace the previously existing Ornithological Bulletin and include pages devoted to other aspects of natural history. It was intended that the first issue would be published in January 1972, but the project has had to be postponed owing to the departure for the West Country of Mr and Mrs R. Allison. Between them they have housed the Society's duplicator and have dealt with much duplicating work for us, including the pages for the Ornithological Bulletin. Mr Allison combined this work with the duties of Business Manager of the Ornithological Bulletin and they were both important members of the production team. Whilst thanking the Allisons heartily for all they have done for us in the past and wishing them well in the future, we would like to extend a welcome to Mrs Mary Anderson, who has nobly offered to house the machine and provide a duplicating service for the Society and its sections. For the time being the Ornithological Bulletin will continue as in the past and the possibility of producing the Society Bulletin will be reconsidered as soon as practicable.

Increasing costs have obliged us to give thought to the printing of our two journals and the decision was taken during the year to transfer this work to provincial printers (F. H. Brown Ltd.). We were sorry to sever the very cordial relationship we had enjoyed with F. J. Milner & Sons Ltd. for so many years.

The Sections have once again completed an interesting and varied programme of meetings. The Ornithological Section's formal meetings continue to attract audiences of 100 and more, whereas only the occasional meeting arranged by other committees ever approaches such numbers. All too often the attendances are pitifully small and the averages reported are correspondingly low. They range from eighteen to thirty, which is much the same as in previous years. Informal meetings are by their nature small gatherings, but are deservedly popular with those who attend them. They are particularly useful in providing opportunities for discussion and in enabling members to examine specimens or watch techniques being demonstrated. Field meetings are enjoyed by many members, notwithstanding continual fare increases and transport difficulties. These range from afternoon walks to extended visits to interesting areas in all parts of the country. This year, the botanists went to Swanage for the Spring Bank Holiday and the ornithologists had three weekend visits to Cley in Norfolk.

A number of projects are going forward on the research front. Mapping schemes are in advanced stages for plants and for birds, though both the Botanical and the Ornithological Committees are urgently appealing for help from members in filling gaps in their recording maps. Several projects are being carried out at Bookham Common by the Ecology Committee and its supporters. Help from other members with this work would also be warmly welcomed.

We conclude this brief report on the Society's activities over the past year with a sincere expression of thanks to all those members and friends who have contributed in manifold ways to the success of its enterprises.

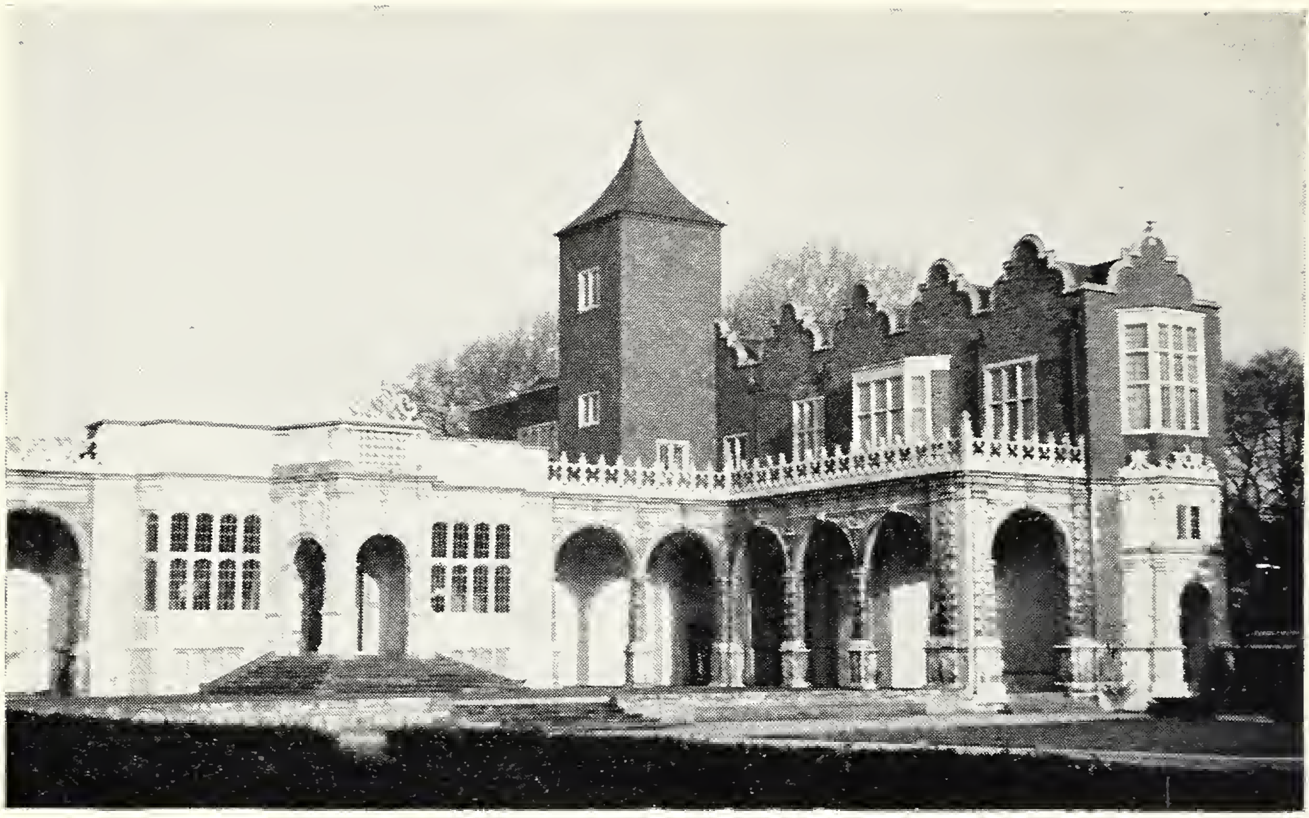

PLATE 1. Holland House: the south front and rebuilt east wing, originally *c.* 1640, of the ambitious Jacobean house. 1967. Photograph by Evelyn P. Brown.

PLATE 2. Holland Park: the chestnut avenue and woodland in zone 1. 1967. Photograph by Evelyn P. Brown.

Studying Wildlife in Holland Park

by Evelyn P. Brown

(*Presidential address delivered on 7 December 1971*)

Introduction

At the start of this address I would like to say how appropriate it is that I should be dealing with Holland Park, because it was members of this Society who did much to assist in ensuring its preservation as a London Park and as a place of considerable natural history significance following the destruction of the old house in the Second World War. These members were the previous lady President, Miss Cynthia Longfield, our two biggest benefactors, the late Mr Maurice Hindson and Mr Cyril Castell, and two of our best known members who are still active, Mr Stanley Cramp and Mr W. G. Teagle. We have, therefore, a special interest in this area and a special obligation to watch and try to preserve its natural history interest; the Society can always put up a strong case for an area where its members are carrying out scientific work and/or using it for field meetings. I am grateful to members of the Society who have assisted me and to the superintendent and staff of the Park.

History of the House and Grounds

As this is a Presidential Address I am going, as far as I am able, to deal will all aspects of Holland Park, Kensington, and first I would like to give a short history of the house (Plate 1) and grounds (Plate 2).

The house, then known as Cope Castle, was built by Sir Walter Cope about 1605; it is known to have been inhabited in 1606. Sir Walter Cope was a favourite of James I and held several appointments. The actual architect of this building seems to be uncertain though there is a book of drawings by John Thorpe at the Sir John Soane Museum which show that Thorpe had a connexion with the building. Inigo Jones and Nicholas Stone are also said to have planned alterations and additions but the only evidence of their having had anything to do with it are the two gate-piers of stone now fronting all that remains of the house, which were made by Stone, whose Notebook contains the following: "Kensington, 23 March, 1629, Nic Stone, undertake for the Earl of Holland 2 Peeres of good Portland stone to hang a pair of great wooden gates on for £100". An engraving of the gates by W. Proud in the British Museum attributes them to Inigo Jones.

Alterations and additions were soon made to the house, there being accounts for 1637 to 1640 relating to additions, and further adjustments came many times during its long life. The fleur-de-lis was the chief emblem in the arms of the Copes, and it can still be seen in the decoration of the remains of the house, but it does not follow that these remains are of the original house, since they are the arms of Sir Walter Cope's daughter, who married Sir Henry Rich, who became Earl of Holland in 1624. Lord Holland's mother was the "Stella" of Sir Philip Sydney. Lord Holland vacillated between the Cavaliers and Roundheads and was executed by the Roundheads in 1649. The house is thought then to have been used by Fairfax for his headquarters for a short time and Cromwell is said to have met Ireton on what may now be the playing field to discuss the affairs of the nation. Ireton was deaf and it was thought by meeting on the field their conversation would be less likely to be heard by eavesdroppers. Lady Holland was, however, permitted to return fairly soon and perhaps rather surprisingly gave encouragement to plays and players, so the open-air performances which now take place in the summer have a traditional background. The house and grounds stayed with the Earls of Holland till 1721 when they passed to William Edwards, subsequently Lord Kensington, but in 1746 Henry Fox, a younger brother of Lord Ilchester took a lease and subsequently bought them. They remained with the Fox family until 1952, when, following the partial destruction of the house during the Second World War they were bought by the London County Council, now the Greater London Council.

Lord Ilchester obtained certain restrictions on the use of the grounds since the London County Council (Holland House) Act, 1952, stated that certain parts of the property, as marked on a plan, shall not be used for certain purposes including a swimming pool, amusement fair, dancing or band music and so on. The G.L.C. also have an obligation to maintain the statue of Lord Holland ". . . in as good order and condition as the same shall be at the date of completion of the sale and purchase (but so that the Purchasers shall not be responsible for its deterioration through natural causes)."

Many famous people have been associated with the house; William III nearly bought it instead of Kensington Palace; Addison married the then Countess of Holland and wrote two charming letters about birds, of Fulham not Holland House alas, to his profligate stepson; Horace Walpole, Charles James Fox, Napoleon III, Samuel Rogers, George Watts, are just a few with associations. With its acquisition by the Fox family, the house became a centre for the Whigs as well as for many cultural activities.

On 14 April 1808 Lady Holland wrote of a stay at Holland House: "We have enjoyed ourselves mightily here: the fresh air, verdure, and singing birds are delicious at all times, but more especially after the dense vapours, gas lights and din of Pall Mall. As yet the melody of the nightingale has only been heard by Lauderdale. He protests to having heard one singing; I know not how far one may depend upon the accuracy of his organs. These rustic pleasures have occupied and kept me out of the way of hearing much news." The singing birds are still delicious, especially if you are lucky enough to hear a dawn chorus, but the nightingale, alas, has not been heard since 1884.

With this brief summary of the history of the house which has been fully written up in two volumes by the late Earl of Ilchester (1937; 1937a) and since then in a more popular style by Hudson (1967), I now pass to the grounds.

The grounds are on the southern slopes of a hill on which in the past springs used to arise. Indeed between 1802 and 1805 the house was thought to be threatened by the water from these springs affecting the foundations. This water was at some time collected on the North Lawn in a big drain and diverted away from the house and I understand that tnis drain still exists. However, in the last ten years, probably due to the drainage when the new comprehensive school was built, these springs have ceased and the small natural pond on the summit of the hill now has to be replenished by a piped water supply, but the three curious stone tanks which formed part of what was at one time a "Japanese garden" still remain full of water with, I am told by the Park staff, no apparent supply.

The grounds, although retaining much of their historic layout are nevertheless and inevitably very different. The Earl of Ilchester (1937a) writes "The drive by which the House is approached from the lodges rises steadily for about a quarter of a mile. Trees and bushes skirt the ascent on both sides, and beneath them in spring a profusion of bluebells carpet the ground". He writes of the elms "which once formed a noble avenue" having gone, but now this drive, the entrance from Kensington High Street, through a fine iron gateway is a broad asphalt path, flanked by trees, admittedly many of them poplars and planes, but with no bushes or bluebells, just grass so trodden as to be barely recognisable. Immediately to the left of this drive is the playing-field. At the top of the drive are the remains of the house.

The retaining wall of the south terrace built in 1848 still remains, and a flight of steps goes up through it, flanked by the Nicholas Stone gate piers to which I have already referred. The east wing of the house has been rebuilt and extended to the east by a modern building built round a grassy courtyard with a small stretch of water in it, the buildings of which comprise the international youth hostel opened in 1959. The ground floor facade of the south front of the house, including the west wing, remain facing a lawn with box hedges and this forms the backcloth, stage and auditorium for the open air entertainments held there in the summer.

Immediately to the west of the house is the "Dutch Garden" laid out in 1812 by Bonaiuti, factotum and librarian to the Hollands. This remains much as it has always been but the fountains have evidently been altered. The ancient brick wall covered with creepers still remains, though part of it had to be rebuilt recently. To the south of the garden runs the remains of a terrace and arcade which linked the house with the garden ballroom and the Orangery, all built in the mid-nineteenth century. These two have been much in the news recently: first the Orangery, which has been used as a place for people to sit in and for meetings and concerts, was the subject of questions in Parliament; then the garden ballroom, which had been used as a restaurant, and the Orangery were damaged by fire. The garden ballroom was originally the granary of the stables and was converted about 1849. The arches alongside it are the remains of the old stables, probably built about 1637/40 and removed when the new garden was laid out in the early nineteenth century. Near these is a seat in the garden wall formed by a Tudor fireplace and known as Rogers' seat, where Samuel Rogers used to sit, and where Lord Holland's couplet, composed in 1812 as a tribute to the poet is engraved on the wall:

> Here Rogers Sat, and here for ever dwell
> With me those Pleasures that he sings so well.

Vandals destroyed this engraving in 1971 but I am delighted to say the G.L.C. has replaced it in its original place. Lady Holland introduced species of *Dahlia* to England in 1804 and the gravel terraces on the west side of the arches mark the place where the seeds were first sown. Near here too are yew trees hiding a pedestal which formerly bore a bust of Napoleon. The Ilchesters of that period were admirers of Napoleon but escaped the fate of the Stuart Lord Holland. In front of it now is a modern Eric Gill statue. The Park staff offices are housed in what were the stables south of the Dutch garden. South of the garden too now lies a new rose garden, tennis courts and a children's sand-pit.

The Park formerly stretched far beyond here and included a lake but this was all sold off and built over during the past century or so. West of the garden now is a car park and the nursery. North of the house and garden are two lawns, one open and one enclosed and in the latter are two beech trees, the remains of a clump of beeches. Here too is one of the two remaining cedars. Cedars were included in the extensive planting which took place in the eighteenth century but while the two remaining may be direct descendants, it is unlikely they are those actual trees. From the north lawn, directly north of the house, is the Rose Walk, formerly flanked by Caroline Testout roses. These are, however, now being phased out and replaced much of the way by plants of *Azalea* and *Erica*. At the end of the Rose Walk is the statue of Lord Holland by Watts and Boehm. Beyond this is the woodland formerly known as The Wildernesse. Here there is a wide variety of trees, including ash, birch, elm, oak, plane, sycamore, some fruit trees and two avenues, one narrow one of limes planted by Lady Holland in 1876 and the other of chestnuts (Plate 2), whose chief glory is the carpet of pink petals in the spring.

Natural History

Geologically the Park is on a gravel ridge with London clay below and there is a sandy top soil, particularly good for the London area.

The gravel varies in depth from a few inches to many feet and this accounts for the tendency for the water to break through in places, which I have already referred to.

In my earlier paper (Brown 1963) I divided the Park into four habitat zones. Now there are only three. The fourth zone which comprised waste land has been tidied up and cultivated. This was to be expected and no one would wish otherwise. It may lessen the number of wild plants and wild birds but the derelict area round the ruins of the house was no beauty spot. This area can now, therefore, be regarded as part of zone 2, the cultivated zone.

There has been little change in zone 1, the wooded area (Plate 2) on the northern side. A few trees have fallen or been cut down, mostly the older ones. The leaf heap in the woods seems to have grown bigger. The dominant plant of the herb layer remains cow parsley (*Anthriscus sylvestris*) and there is still plenty of bramble and holly. Some care should be taken in studying the flora since an attempt was made some years ago to grow many species of wild flowers along the north side of Chestnut Avenue. Some, of course, have thriven to the extinction of others, but it was always on the shady side for many plants. However, there is a clearing at the end of Chestnut Avenue where dusky cranesbill (*Geranium phaeum*) and globe flower (*Trollius europaeus*) are to be found. There are signs, too, that the Clean Air Act is taking effect in the increase in mosses. Mistletoe (*Viscum album*) has appeared on a chestnut tree on the edge of the wood. Some natural regeneration takes place since there are many yew seedlings to be found in the woods—there is a big yew tree in one of the gardens nearby and the thrushes in particular like the berries. It seems more likely that the regeneration takes place from this yew than from those in the Holland Park garden itself. Oak seedlings can also be found but there are always far too many sycamore seedlings and the Park staff have to keep these under control. A house has been built in the north-east corner for the Park staff and one of the best owl trees was removed to accommodate it, but a cedar is still there, and one old elm used by owls for over fifteen years remains. This is the area least crowded by the public but there is an increasing tendency for dogs to run unleashed and boys and hippy-like characters to invade the enclosures. There is, however, a children's adventure playground on the edge of the wood in the south-west corner where children can unleash their energy without doing damage. This is still the best area for birds and the dawn chorus can rival and even beat many a country dawn chorus. Its power defeats any attempt at individual identification and needs to be experienced to be believed so close to the centre of London.

Zone 2 is the cultivated area in the southern part of the grounds; apart from the alterations to the café and restaurant arrangements and the addition of the area round the house, it has also altered little. In this zone there has been one marked change in the habits of the birds. This is the increasing tendency for the black-headed gulls to come down and feed actually on the playing-field, probably because fewer trees and more buildings now surround it, or maybe there are more tame gulls. Early in the morning and when the playing-field is closed for rehabilitation, as it usually is at the beginning of the year, this playing-field cannot be ignored by anyone watching the birds. Here come the redwings if it is cold after Christmas, and here too come some unexpected migrants, such as a wheatear twice in April 1970. Mistle thrushes, song thrushes, many blackbirds, and two or three crows can usually be found here but the flocks of starlings are smaller than they were. The gardens are now floodlit up to midnight but this has in fact probably affected zone 3 more than zone 2.

Zone 3, the intermediate zone in the central part of the grounds, has not altered much as far as vegetation is concerned, although some of the conifers planted since the G.L.C. took over have grown considerably, and people seem to get into the enclosures more than they did. The willow warbler no longer even attempts to breed; the blackcaps and chiffchaff territories are based more in the woodland, the woodpigeon roost has gone, probably because of the floodlighting, but the birches and the conifers still attract birds, for instance tits, redpolls and goldcrests.

From the entomology point of view there are obviously many small animals. One gets bitten in the woods in the summer! There are no longer any dragonflies, and except for the odd cabbage white one rarely sees any butterflies. I saw a member of the public pick up a black moth, probably a melanic pepper moth, one day. There are wasps and a solitary bee which can be watched emerging from holes in the ground in the spring but I think an expert study might be interesting.

The mammal situation has worsened in that grey squirrels appeared in 1969 and have now increased in numbers to some five or six. The public like them but they may be affecting the owls and further depredations will undoubtedly follow. There no longer appear to be any hedgehogs but occasionally a mouse, presumably a house mouse, is seen, and a bat was recorded in 1970.

The wood pond is obviously a traditional frog spawning place and they still appear in some numbers towards the end of March but the depredations of the schoolboys may have an adverse effect.

Such curious animals can be let loose in the Park by the public—three domestic rabbits appeared on one occasion—that mammal records must always be regarded with some suspicion.

Bird Population

The bird population appears to have stabilised and the annual figures since 1964 remain remarkably similar. This date has been

TABLE 1. The breeding birds of Holland Park, 1964-1971. B=bred; b=probably bred; O=observed.

	1964	1965	1966	1967	1968	1969	1970	1971
Mallard	B	B	B	B	B	B	B	B
Woodpigeon	B	B	B	B	B	B	B	B
Tawny owl	B	B	O	O	O	O	B	O
Great spotted woodpecker	O	B	b	b	O	O	b	O
Carrion crow	B	B	B	B	B	B	B	O
Jay	B	B	b	b	B	B	B	B
Great tit	B	B	B	B	B	B	B	B
Blue tit	B	B	B	B	B	B	B	B
Coal tit	B	O	B	B	b	b	B	B
Long-tailed tit	O	—	—	—	—	—	O	B
Nuthatch	b	O	O	O	O	O	b	B
Wren	B	B	B	B	B	B	B	B
Mistle thrush	O	b	B	b	B	B	O	O
Song thrush	B	B	B	B	B	B	B	B
Blackbird	B	B	B	B	B	B	B	B
Robin	B	B	B	B	B	B	B	B
Blackcap	B	B	B	B	B	b	B	b
Chiffchaff	O	O	O	O	O	O	b	b
Goldcrest	O	O	O	O	O	O	O	B
Spotted flycatcher	B	B	B	O	B	B	B	B
Dunnock	B	B	B	B	B	B	B	B
Starling	B	B	B	B	B	B	B	B
Greenfinch	B	b	b	b	B	B	b	b
Bullfinch	O	O	O	B	O	B	B	B
Chaffinch	B	B	b	b	B	B	b	B
House sparrow	B	B	B	B	B	B	B	B

TABLE 2. The non-breeding birds of Holland Park, 1964-1971. Gulls flying over are not included. O=observed.

	1964	1965	1966	1967	1968	1969	1970	1971
Cormorant	—	—	—	—	—	—	—	O
Heron	—	—	—	O	O	O	O	—
Geese spp. including Canada	—	O	O	—	—	—	O	—
Mute swan	O	—	—	—	O	O	—	O
Kestrel	O	O	O	O	O	O	O	O
Moorhen	—	—	—	—	O	O	—	—
Lapwing	—	—	O	—	—	—	O	—
Common gull	—	—	O	—	—	—	O	O
Black-headed gull	—	O	O	O	O	O	O	O
Collared dove	—	—	—	O	—	—	—	—
Cuckoo	O	—	O	—	O	—	—	—
Swift	O	O	O	O	O	O	O	O
Skylark	—	—	—	—	—	—	O	—
Swallow	O	O	—	O	O	—	O	—
House martin	O	—	O	O	—	O	—	—
Jackdaw	O	—	—	—	—	—	—	—
Magpie	—	O	—	O	—	—	O	O
Treecreeper	O	O	O	O	O	O	O	O
Fieldfare	—	O	—	O	—	O	O	O
Redwing	O	O	O	O	O	O	O	O
Wheatear	—	—	—	—	—	—	O	—
Redstart	O	—	—	—	—	—	—	—
Sedge warbler	—	—	—	—	—	O	—	—
Garden warbler	O	O	O	O	—	O	O	O
Whitethroat	O	O	O	O	O	—	—	—
Lesser whitethroat	O	—	—	—	—	—	—	—
Willow warbler	O	O	O	O	O	O	O	O
Wood warbler	—	—	O	—	O	O	—	—
Pied flycatcher	—	O	—	—	—	—	—	—
Pipit spp.	—	—	—	—	—	—	O	—
Pied wagtail	O	O	O	O	O	O	O	O
Grey wagtail	—	—	O	—	—	O	—	O
Hawfinch	—	—	—	—	O	—	—	—
Goldfinch	O	O	O	O	O	O	O	O
Redpoll	O	O	—	—	—	—	O	O
Brambling	—	O	—	—	—	—	—	—

taken as the base date since earlier years were covered in my two previous papers (Brown, 1963, 1964). The number of proved breeding species (Table 1) in four out of the eight years is 18, excluding feral pigeons, and the total number of species observed (Table 2) and breeding varies from 41 to 46. The breeding species figure can be raised to an average of 20 with the inclusion of species for which no firm breeding evidence has been obtained but which have been present and singing throughout the breeding season, while the total list of species observed could probably be raised to 50 or more by daily early-morning visits, though the absence of any substantial piece of water inevitably limits this. These figures show a slight drop on the peak years of 1960-63 but a slight increase over the 1950's period. It is worth noting that the years 1966-67 were the lowest and 1970 the highest. The number of species observed but not breeding also remains remarkably consistent, ranging from 21 to 24 with 22 being the figure for five out of the eight years, even though the species recorded varies.

The problems of studying the bird life of Holland Park include the necessity of not looking for nests since, with one or two exceptions such as crows, to find a nest will mean that it will almost inevitably be found by some predator, human or otherwise; carrying nesting material or food and in most cases the presence of young birds are the best breeding evidence, though even the latter may be misleading at times. The dense canopy in the late spring and early summer, while of great benefit to the birds, also inhibits easy observation. Another problem is that the density of the bird population fills census maps with symbols to a much greater degree than Bookham Common maps for instance, although many of the birds recorded as seen may be birds that have come into the Park to feed or be fed. However, I have known as many as six robins together sparring in one place in April. Also the birds get to know those who feed them and may well follow people long distances in the Park with the obvious danger that they may be recorded more than once, though it is often possible to recognise individual birds by some behaviour or even some defect—there has been a one-legged robin, a blue tit with an elongated twisted beak, and an almost albino blue tit. Another difficulty is not drawing the attention of the public to what one is watching. Breeding success is low, with the greatest success late in the season when the foliage is thick; late breeding can occur because of abortive earlier attempts.

Breeding Species

In order to provide comparison with earlier years I am following the lines of my previous papers and come now to the breeding species. There have been no marked gains or losses during the period 1963-1971. There are, however, some trends on which to comment. Although tawny owls have been seen during 1971 and pellets were found in July, during the latter part of the year they have not appeared at their usual roosts. This is not unusual with tawny owls but nevertheless it seems possible the grey squirrels may be adversely affecting them. Two squirrels were playing on one of the usual owl trees recently. I have seen only two dreys, and those recently, and it seems possible the squirrels may have been using the owl holes. Owl pellets found during the summer still show a predominance of bird prey.

The great spotted woodpecker may be in danger. There is no evidence of successful breeding since 1965, although there has been hole-making in subsequent years. In 1971 no female was recorded. The Park staff reported a dead male in April but a male was subsequently seen and although it may have bred elsewhere, there may have been a sexual imbalance. There are still plenty of old trees in the Park so the only apparent habitat change is the building up of the surrounding areas. However, this species seems to read my thoughts! I was expressing my unease about it to a Park keeper in June when suddenly one called and a few minutes later I saw a male. There were no further records until in September I was again expressing my doubts, this time to Mr Maurice Ogle, an elderly gentleman who is very interested and has given me much help. Suddenly the woodpecker called and again I saw a male. I saw it twice shortly afterwards but it has been silent since 9 October. Had I better try and call it up again!

The absence of the crow from the breeding list will not even counter-balance the grey squirrel since crows are still around and frequently breed in Ladbroke Square. The mistle thrush is more disappointing but this species often feeds on the playing-field and may well breed in some of the large trees in the nearby enclosed gardens. The willow warbler I have already mentioned—disturbance rather than habitat change seems the explanation here.

Turning now to more hopeful prospects—the nuthatch, absent as a confirmed breeding species between 1965 and 1970 and appearing to be represented by only a single bird, trebled its representation in 1971 and three birds were very active in the spring with much chasing, which eventuated in successful breeding. There are still two birds in the Park and I hope this species is on the upgrade again. They are popular birds and come readily for food. The coal tit is also on the increase with at least two and probably three pairs the last two years. I have watched one of this species take nuts from my hand and hide them under grass tufts. The chiffchaff too has made a come back, being present singing till the end of June in 1970 and 1971, probably breeding in 1970 and likely breeding in 1971. It is colonising the woodland zone 1, not zone 3.

There were, however, two gains this year in the first recorded breeding of long-tailed tit and goldcrest. I am not optimistic enough to think they will become regular breeding species as both seem to have had several good breeding years and to have increased throughout the country, probably helped by recent mild winters. What appears to be a permanent gain, however, is the bullfinch which has now bred in three consecutive years, 1969, 1970 and 1971. Holland Park is big enough to absorb one pair of these attractive but destructive birds.

Turning now to the regular breeding species, the mallard has shown a marked increase but this is probably because a duck count is carried out monthly on the new stretch of water outside the Commonwealth Institute rather than because of any actual increase in the Park itself. The count has led to the species being recorded in the Park throughout the year, while up to 1964 it had tended to be absent in the autumn and winter. Indeed the appearance of a pair of mallard on the wood pond could before 1965 be regarded as an indication that spring was on the way. This species is frequently seen in trees in the spring which leads to the supposition that some of them may be breeding in the trees. An obvious sign of over-population was the killing of two well-grown ducklings by a female on the wood pond on 7 May 1971.

The woodpigeon has decreased quite considerably in numbers, with as always low figures for October and November but also lower figures for May, although since they tend to breed later in the year this may not have too much significance. There is no longer a winter roost. Feral pigeons are no longer being counted. This species collects in large numbers at spots where it is usual for the public to feed them, for instance the High Street, Kensington Gate, where there are usually upwards of eighty waiting to be fed. They are no longer breeding on the buildings in the Park but they are much more frequently to be found in the woodland and, having a tendency to sit in the trees in the spring, delude one into the hope that there may be a breeding stock dove.

The jay seems to have reduced slightly in number. As even Holt Macpherson found, breeding evidence for this species is difficult to obtain but there appear to be two pairs holding territory in the woods and the spring assemblies have not got into double figures as they have done in the past. Jays feed from the litter baskets and apparent untidiness by the public may be because the jays have thrown paper put into the baskets on to the ground round about.

The great and blue tits show little variation in breeding numbers nor has there been any big winter influx though the figures show a considerable increase in January 1970. The wren shows no change although it is worth noting that although nests were known in 1971 no young birds were seen, and families of young wrens have in the past had no difficulty in making themselves known.

The song thrush shows little breeding variation, but in September 1968 ten were counted feeding on *Cotoneaster* berries and although that number has not been seen again there does seem to be a tendency for small numbers to appear at the appropriate time in the autumn when *Cotoneaster* or yew berries are ripe.

Apart from the house sparrow and the feral pigeon, the blackbird remains the most common bird of the Park. The number of singing males during the breeding season is not high which indicates that many of those seen in the Park are probably there to feed, but this adaptable species has been recorded breeding unusually high in trees and with unusual nesting material such as cellophane. It is perhaps worth noting that an almost white blackbird has again appeared in November 1970 and is still there in the north-west corner of the Park at the bottom of Chestnut Avenue, the same territory occupied by a similar bird for about seven years up to March 1965. The Earl of Ilchester (1937a) records an almost white blackbird in this same area in the 1930's. In the winter many of these birds roost in the hollies in many parts of the Park.

Robins are still plentiful with a slight increase in numbers. Although they are to be found in the other zones, it is the woodland zone 1 that is their stronghold. Some of them will come on the hand. The blackcap has had an average of two pairs and usually breeds successfully. The combination of oak trees with an undergrowth of bramble and holly is conducive to this species. The spotted flycatcher increased to three pairs in 1971 and also usually breeds successfully.

The dunnock again is a common bird, more common because of its unobtrusiveness than the figures show, but even so there has been a considerable increase in its numbers. This bird, though it can be seen in all three zones, is principally to be found in zone 3. Starlings, on the other hand, if anything have decreased. They still occupy the same trees but there are no longer such big flocks on the playing-field and the Park is not a gathering ground for the roosts in the winter.

Greenfinch numbers vary but there is a small breeding population, and the chaffinch remains at two or three pairs, usually to be found in zone 2, the cultivated zone, although they may feed in the woods. The house sparrow is everywhere. Counts are no longer being taken. Winter roosts include the big patch of bamboos, the palm trees which are also occupied all the year round, and until the fire, the windows and arches of the Belvedere Restaurant and neighbourhood.

Non-Breeding Species

Of the non-breeding species, the kestrel, swift, treecreeper, redwing, willow warbler, pied wagtail and goldfinch have been recorded every year (Table 2). The goldfinch has, of course, bred in the past but is unlikely to do so again with the disappearance of zone 4 and its seeds. Unexpected records were a sedge warbler in 1969 and a wheatear in 1970. A moorhen stayed by the wood pond for several months in the winter of 1968/69 and redpolls have appeared during several winters. Whitethroats were recorded every year to 1969 but have not been observed since—significant in view of their general reduction in numbers. Garden warblers are recorded most years but they are in competition with the blackcaps and indeed one is thought to have been driven out of the wood near the hostel by a blackcap in 1970. A hawfinch appeared in 1968, a brambling in 1965, and magpies and cuckoos are recorded occasionally.

Conclusion

It is difficult to assess the significance of the changes in the wild life of Holland Park over these eight years. Some features, such as the black-headed gulls coming down on to the playing-field, the increasing numbers of feral pigeons in the woods, the decrease in the great spotted woodpeckers and the failure of the willow warblers to breed seem to indicate greater urban pressure and the adverse effect of more people in the Park.

On the other hand the breeding of the long-tailed tit and goldcrest and the probable breeding of chiffchaff may point to the able management of the woodland and the growth of planted trees and shrubs to a point at which they provide a suitable habitat for these species. Birds such as the coal tit and bullfinch may have become more adaptable.

It is to be hoped that the increasing tendency for people to invade the enclosures, run their dogs unleashed and so on will be kept sufficiently in check to enable the more unusual species to continue to breed, and that there will continue to be people interested in feeding the smaller birds, such as the tits and robins rather than letting the feral pigeons overrun the Park.

Anyone who has studied the bird life of an average south of England or even a Midland deciduous wood will know that they would see as many wild birds on a morning walk in Holland Park as they would in a similar country walk and at much closer range and with a much better chance of identifying them.

The use of the *Reports by the Committee on Bird Sanctuaries in the Royal Parks* is acknowledged in the compilation of the Tables.

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Recording Maps and Overlays

by H. A. Sandford

(*Mapping Schemes Secretary*)

Since the publication of the *Atlas of the British Flora* it has become clear that there are great advantages in the grid recording system, in which the presence or absence of a plant or animal is recorded for each square of a grid across the map. There is no longer an infinite number of places to search but a limited number of areas. These are precisely defined if the national grid of the Ordnance Survey is used, and it becomes possible to compare the results of past and present surveys or the distribution of an insect with that of its food plant. Messrs Cramp and Gooders used grid maps effectively in their study of the house martin (Cramp & Gooders 1967).

The smallest recording square normally used is the 1 km square which is printed on the Ordnance Survey 2½ and 1 inch maps. These are called 'monads' and a block of four is called a 'tetrad'. Mr Burton's distribution maps of the common frog and common toad (Yalden 1967) employed monads while the Botany Section's mapping scheme is using tetrads.

Monads and tetrads are squares and cannot make a perfect fit with the Society's circle, 20 miles radius from St Paul's: our recording Area has become, in effect, a polygon (Fig. 1). This polygon is very slightly larger than our circle, which still remains our official Area. The map shows a black and white version of the recording map with the recording polygon added.

The large squares on this map are 10 km square and can be called 'centads'. Each centad lies in a vertical column and in a horizontal row and so we can say that St Paul's, marked by a cross, lies in centad 38, that is, in column 3 and row 8. The tetrads are not drawn on the map but they are marked in the margin and their column and row numbers are also given. To identify a tetrad it is necessary to give the number of the centad in which it lies followed by the column and row numbers of the tetrad itself. For instance, the north-west corner of the Inner London Area, marked by an oblong, is in tetrad 28/T24 (that is, centad 28, tetrad column 2 & row 4). The monads are marked in the margin but their columns and rows are not numbered. If they were numbered their numbers would run 0, 1, 2, 3 . . . . . 9. The north-west corner of the Inner London Area is in monad 28/M34 (that is, centad 28, monad column 3 & row 4).

Published distribution maps are going to be uniform in scale and design so that they can be easily compared. This will also make it possible to use overlays showing the variation in soils, rainfall, air pollution and so forth over our Area. One of these is distributed with this issue and shows the average annual rainfall; snow is recorded as its equivalent in water. This map is based, with permission, on the latest edition published by the Ordnance Survey (Ordnance Survey 1967). In redrawing the map the isohyets or rainfall lines have been made to conform with the tetrad grid lines. This makes it easier to compare the distribution of species with the distribution of rainfall without reducing the accuracy of the isohyets for this purpose.

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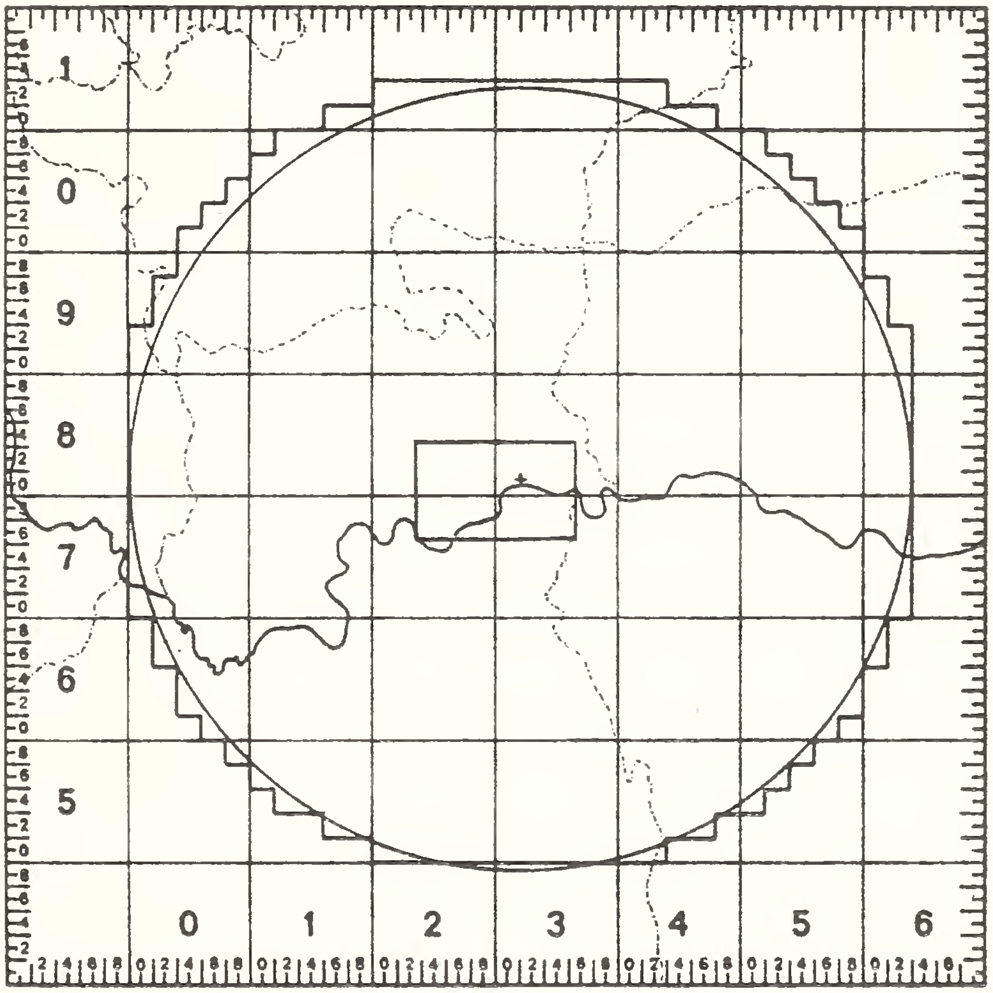

FIG. 1. The revised recording map of the London Area.

The Albino Form of the Grey Squirrel in the London Area

by M. Towns

The London Natural History Society's mammal records now contain a number of reports of albino (white-coated) grey squirrels (*Sciurus carolinensis* Gmelin).

A squirrel receives half its gene complement from one parent, and half from the other parent. To produce their effect the homologous genes combine. The albino gene in the grey squirrel is recessive (Searle 1968). That is if an albino gene and a "normal" gene combine, the coat colour of the squirrel is the normal grey-brown. However if both genes are albino the coat colour of the squirrel is white and the animal has pink eyes. This is known as homozygous expression. So the albino homozygous expression depends on there being at least two squirrels, of differing sexes, carrying the recessive albino gene.

The chances of an homozygous combination occurring in a natural population are usually very remote. An albino mutation occurs only once in many thousands of offspring, and is very easily lost from the gene pool. Add to this the loss by predation or disease of pure albino forms, or individuals carrying the albino gene in a recessive form, and chance becomes heavily weighed against albinism.

However, interference by man can greatly reduce or even eliminate the odds against albinism. For instance in the United States of America there are a number of grey squirrel populations with high albino ratios. In the city of Illinois a pair of albino grey squirrels was released and have since established an albino colony of several hundred individuals (Shorten 1954).

The grey squirrel was introduced into Britain from North America. Numbers of them were released, or escaped from captivity into several localities. Some of these animals originated from groups imported because of some unusual features they possessed, such as albinism or melanism (black coat). A number of groups introduced into Kent, Surrey and Sussex are thought to have been carrying an albino gene (Shorten 1954) and in fact there are frequent reports of albino squirrels in these counties.

The accompanying map (Fig. 1) shows the London Natural History Society's records for albino and part albino grey squirrels. All the records are from vice-county Surrey, except for two records from one locality in Kent. There are no records north of the River Thames and even more striking is the limited area in which the sightings are contained. As recorder the first question one must ask is: "Is this distribution a real one, or only an apparent distribution due to observer or other bias?" Surrey has a large number of regular observers, while north London suffers from a lack of recorders.

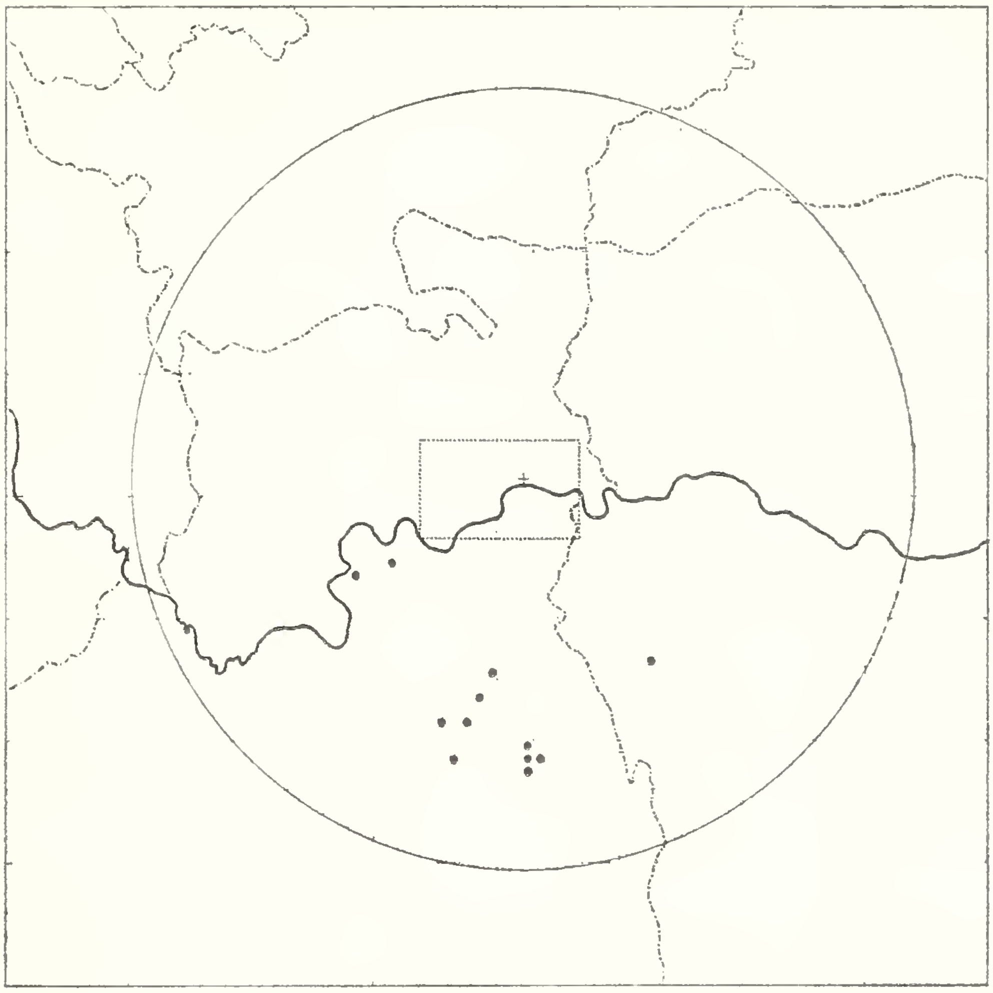

FIG. 1. Distribution of the albino grey squirrel in the London Area.

Albino squirrels are, however, very distinctive and unusual enough to ensure that when one is seen there is a good possibility of its being entered into the Society's records. Coupling this with the information on the release of albino-carrying strains of grey squirrel in the south, the totally southern distribution in the London Area is in all likelihood a real one. I have no knowledge of albino-carrying squirrels being released into the London counties north of the Thames, although melanic individuals occur in Hertfordshire.

Next the recorder has to consider whether records from adjoining grid squares are in fact just several sightings of the same squirrel, even though these sightings may be a few years apart. Shorten (1954) made an analysis of the age structure of fourteen grey squirrel populations, using tooth wear as an indicator of age. Her analysis yielded the following age ratios: 56 per cent. in their first year, 32 per cent. in their second year, 7 per cent. in their third year, and 5 per cent. in their fourth year. An adult will forage over two or three acres while young squirrels would probably range further than this. So, an individual squirrel has a possibility of surviving for at least four years, and during that time may wander into adjoining 1 km grid squares although probably not much further afield. Bearing this in mind let us look at the records of albino grey squirrels which are set out in Table 1.

Table 1. Records of albino grey squirrels in the Society's mammal records.

Date	Number	Recorder	Grid reference
1959/1960	One to three	W. Bailey & V. Green	TQ 4266
1960	One	J. A. Burton	TQ —— (Beddington)
1964 November	One	Lewisham Natural History Society	TQ 4266
1964	One	W. E. Holland	TQ 2863
1964 October/ November	One	J. R. Laundon	TQ 2965
1964	One	M. S. Andrews	TQ 2965
1964 November	One	P. J. Wilson	TQ 3257
1965 August/ September	One	H. J. Freeman	TQ 3358
1965	One	A. Freeman	TQ 2658
1966 March	Two together	A. Fisher	TQ 2658
1966 September	One	G. Kinns	TQ 1873
1966/1967	One part white	G. Kinns	TQ 2174
1967 May/June	One	K. H. Hyatt	TQ 3258/3259
1968 September	One	Mrs Curry	c.TQ 2561
1968 November	One part white	Mrs Curry	TQ 2561
1971 October	One	R. H. Targett	TQ 2761

There are two records from Bromley Common (TQ 4266), one for the period June 1959 to May 1960, when up to three squirrels were seen, the other from November 1964, when one albino animal was seen. Similarly there are three records from Beddington, one for 1960 (unfortunately no grid reference was supplied with this record) and two separate records tendered in 1964 (TQ 2965). It is likely that the two records for 1964 are in fact of the same animal. However, in both of these groups of records there are gaps of several years between sightings. Are these later sightings the same squirrels as seen in earlier years? Or are they separate occurrences of albinos? Using Shorten's tooth wear index as a guide it seems there is a slim possibility that these are sightings of the same albinos, yet there is still some doubt, which only perhaps untendered observations could clarify.

At Kenley an albino was sighted in 1964 (TQ 3257), and another in 1965 (TQ 3358). These two records could be for the same squirrel, but is it the same one as seen in 1967 (TQ 3258, 3259)? Again using Shorten's tooth wear index, there is a 32 per cent. probability that it is.

In 1965 one and in 1966 two albino grey squirrels were seen together at Banstead (TQ 2658), no further information on these squirrels having been received.

Finally if we put together the groups of sightings, we are left with six localities, four of them in an area nine kilometres by nine kilometres, in which for each year from 1964 to 1968 there has occurred at least one albino form. Regular observation of these beautiful animals could provide much information of general interest on London's squirrels. Details such as whether the albino breeds, how many to a litter and their subsequent fate could provide insight into the frequency with which the gene for albinism is carried in natural populations. After all the albino grey squirrel is so distinctive that it should present fewer complications for a study than many other mammals.

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The Status of the Silver Bream in the River Thames

by Alwyne Wheeler

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In 1957 when I wrote an account of the fishes of the London Area (Wheeler 1958) I had no confirmed records of the occurrence of the silver or white bream, *Blicca bjoerkna* (Linnaeus 1758). Marlborough (1965) recorded the capture of one by an angler at Twickenham A.S. Pit, Wraysbury, and thus was the first to publish a positive record from the London Area, although by that time I had obtained confirmation of its presence in the Thames system.

A number of records of silver bream in the Thames exist in the angling literature, but as I pointed out this species is frequently confused with young bronze bream, *Abramis brama* (Linnaeus 1758) and it was not possible to corroborate these angling literature records. Confusion also occurs between silver bream and specimens of bream x roach (*Abramis brama x Rutilus rutilus*) hybrid which occurs occasionally in the Thames.

It was with the knowledge that the silver bream is frequently confused with other species, and that such records as were available came from uncritical sources that I hesitated to include it in my list. This course seemed reasonable also because Regan (1911) wrote that in the British Isles the silver bream occurred "in eastern rivers from Yorkshire to Suffolk", thus specifically excluding the Thames catchment. The contradictory nature of this exception in relation to Regan's hypothesis for the colonization by stenohaline freshwater fishes of the British Isles could not have been apparent to him, for the statement occurred in a discussion on geographical distribution. Regan's hypothesis was that colonization of English rivers occurred during a period of eustatic depression of sea level at the end of the last glaciation, when the eastern English rivers flowed across the exposed Doggerland in what is now the North Sea and connected there with continental rivers. Present concepts of the existence of a land bridge in the North Sea during pollen zones IV - VII (*c*.10,500 - 7,000 B.C.) (see Godwin 1956, and Castell 1959) are basically unaltered, and there can be little doubt that many of our primary freshwater fishes (those that cannot survive prolonged exposure to sea water) originated in this way. In view of Regan's acceptance of the origin of these fishes in the British Isles it is more than curious that he made no comment on the supposed absence of the silver bream from the Thames. In general, the indigenous Thames fauna is the same as that of the eastern English rivers northwards to, and including, the Yorkshire rivers, and the fauna of all is similar to that of the River Rhine but with fewer species. Thus it is not surprising that the silver bream occurs in the Thames—it would be more surprising if it did not.

Specimens of silver bream have been collected by myself in the River Thames at Reading in April 1961, (seven specimens 59 to 93 mm in standard length, B.M.(N.H.) 1961.4.19.66-72). The British Museum collection also contains two specimens from Moulsford Reach, both 235 mm in standard length (B.M.(N.H.) 1936.3.2.1 and 1942.4.7.14.). Both these localities are outside the London Area, and it is strange that although many hundreds of *Abramis brama* (and other species of cyprinid fish) have been examined in my recent work on the fishes of the tidal Thames, no *Blicca bjoerkna* have been discovered. The reason for their absence downstream is not known. The silver bream does, however, occur in some numbers in a former gravel pit, now the Chase Fishery, Dagenham, and I have examined many specimens of this species and *Abramis brama* from this water, which lies well within the London Area.

In view of the similarities between the two British freshwater breams, some simple diagnostic features are tabulated below, based on the descriptions in Wheeler (1969). The use of a single feature, such as the number of anal rays, as advocated by Marlborough (1965) is not sufficient for critical determination.

	Abramis brama Bronze bream	*Blicca bjoerkna* Silver bream
Branched anal rays	24—30	21—23
Anal fin origin	Below mid-dorsal fin	Below first dorsal ray
Diameter of eye	Less than snout length	More than snout length
Scales in lateral line	51—60	44—48
Pharyngeal teeth	One row, 5 each side	Two rows, 2 + 5 each side

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A Review of the Macrolepidoptera of the London Area for 1970 and 1971

by C. G. M. de Worms

The present review of London's macrolepidoptera covering the past two years is a logical sequence to the previous biennial account for 1968 and 1969 which was published in the *London Naturalist* **49:** 82-89. The new legislation to re-shape a number of counties and to alter their boundaries does not appear likely to affect the London area to any appreciable extent. For natural history surveys the old Watsonian vice-county boundaries are still being adhered to and are likely to be followed for many years in spite of these proposed boundary changes.

As on previous occasions I have been admirably assisted in compiling this survey by a number of recorders domiciled in the various vice-counties contained in the London Area. Many of them have produced very comprehensive lists of their observations on local species, usually noted at static light-traps situated at or near their home, while the daytime insects have as a rule been seen in the vicinity of, or even in, their own gardens. To all these individuals, some of whom are newcomers, I would like to express my sincere thanks for their efforts and for all the trouble they have taken once more in helping with this biennial survey.

The weather is always an all important factor when assessing the incidence of insects in any particular season and in the case of the two under review, 1970 had a somewhat cool start but after a bleak March, spring burst forth in an exceptionally hot first half of June with almost record temperatures in some parts of the country. The main summer period was not unduly wet, while the autumn, till the end of October, was mild and fine. As a contrast 1971 opened with an extremely mild winter and sunny early spring. But June was a very wet and bleak month on the whole. Summer temperatures soared in July which was very warm and fine, while the late autumn, especially October, was one of the sunniest on record. However, in spite of these two very congenial years the unfortunate feature of both of them was the lack of migrant species which is most unusual for two consecutive seasons. There was a general absence of such regular butterflies as the red admiral and painted lady which sometimes come in from the Continent in huge numbers and invade the London Area. The same can be said of the more spectacular hawk moths such as *Acherontia atropos* L.* (the death's head), *Herse convolvuli* L. (the convolvulus) and *Macroglossa stellatarum* L. (the humming-bird) hardly any of which were recorded in the British Isles for either year. However, there was some compensation with some of the indigenous species, especially the butterflies in general, which were reasonably numerous throughout the summer periods of both 1970 and 1971. It was the small group of hair-streaks which had a remarkable burst of abundance in 1970 but with less prevalence in 1971. In particular the delightful little *Strymonidia w-album* Knoch (the white-letter hairstreak) was in great plenty in many of its normal haunts and appeared in several new ones. In some of its northern localities such as Whippendell Wood, this little butterfly was in hundreds and it reappeared near the Area's boundary in north-west Surrey. Another most attractive little butterfly, *Celastrina argiolus* L. (the holly blue) was once more to be seen in plenty in many parts of the Metropolis in both summers as it was in other parts of southern and eastern England where it seems to have had a remarkable resurgence after many lean years.

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*Brackets are omitted from authors' names in accordance with current practice in this group.

Starting with a resumé of the more outstanding records and captures over the two seasons as already stated, neither year was noteworthy for any large influx of any specially regular or uncommon migrant species, as had happened in most of the preceding years. However, a few notable migrants were reported and foremost among these was a *Nymphalis antiopa* L. (the Camberwell beauty), that famous butterfly which always attracts much attention. A very fresh specimen was caught in South Harrow in August 1970 by Mrs B. J. Houghton who kindly presented it to the national collection at South Kensington (*Entomologist's Rec. J. Var.* **83**: 153). It is only to be hoped this insect was not a release through importation or breeding from foreign sources, as unfortunately, has so often been proved with this fine butterfly.

Another important record among the migrant butterflies was that of a male *Lampides boeticus* L. (the long-tailed blue) seen distinctly settled on a flower in the gardens of the Royal Horticultural Society at Wisley on the fringe of the Area by Mr R. F. Bretherton in September 1971. It is some twenty years since this near ubiquitous insect was last seen in the Area.

Among the moths there appears to be only one species new to the Area. In June 1971 Mr G. Prior took in his trap in North Harrow an example of the small noctuid **Eustrotia bankiana** F. (the silver-barred), a most surprising insect to find in such a built-up region, since its normal habitat is in a few fens in Cambridgeshire and on open damp moors near Killarney in Ireland. Occasional specimens have been recorded in southern England but they are probably migrants like the one in question. A few other rarities have turned up in unexpected localities during the past two years. In October 1971 Mr P. J. Baker, who lives near the boundary of the Area between Thorpe and Virginia Water, took the third record of *Leucania unipunctata* Haworth (the white-speck wainscot). The only other records of this migrant moth are from West Norwood in 1962 and Lee in 1968. It appears regularly in our south-western regions, but is very uncommon in the eastern half of the country. Another capture of which there is only one previous record for the Area, from Weybridge in 1953, was *Oria musculosa* Hübn. (the Brighton wainscot), which found its way into Mr Baker's trap in August 1970. This species, with headquarters in Wiltshire wheatfields, seems to be gradually extending its range eastwards, as far as Surrey. Yet another surprise capture was *Calophasia lunula* Hufn. (the toadflax brocade) at Bookham by Mr P. A. Sokoloff in July 1970. Again only one previous record appears for the Area, from Dartford in 1953. This moth has spread rapidly in the south-east since it was first discovered to be breeding in Kent and Sussex in the early 1950's and the same can be said of *Hadena compta* Schiff. (the varied coronet) which had a similar origin and is now spreading all over the London Area wherever sweet williams are grown, its larvae riddling the seed pods. Another little moth which seems to be extending its range considerably is *Hapalotis venustula* Hübn. (the rosy marbled). It appears to have installed itself well in Joyden's Wood according to Mr B. West. Yet a further rarity for the Area was a specimen of *Harpyia bicuspis* Borkh. (the alder kitten) taken at Selsdon in June 1970 by Mr E. H. Wild. This uncommon moth has only very few previous captures in the Area: Limpsfield, in Surrey and Otford and Bexley in Kent. Two remarkable aberrations of *Catocala nupta* L. (the red underwing) were reported: one from Orpington in August 1971 with brown hind wings, taken by Mr P. Sokoloff, and another with almost black hindwings (ab. *nigra* Cockayne) once more captured by Mr R. I. Lorimer at Totteridge in September 1970. This is his fourth example of this rare and handsome form to appear in this locality and he estimates its incidence may be as high as one per cent. But in many ways some of the most interesting records come from the mercury-vapour moth-trap run regularly still each season in the garden of Buckingham Palace. In 1971 it reached its twelfth consecutive year there and has provided some most unexpected species including several more that are new to Inner London. A special feature of latter years has been the appearance of several species associated with pine trees and heathland which is not the type of terrain likely to be found in the central part of the Metropolis. There has been a distinct increase in the numbers of the *Thera obeliscata* Hübn. (the grey pine carpet) and of *Semiothisa liturata* Clerck (the tawny barred angle), both pine feeders, while an unusual newcomer has been *Lycophotia varia* Vill. (the true lover's knot), normally occurring amongst heather. *Parastichtis suspecta* Hübn. (the suspected) is yet another insect to be found mainly among birches on heaths. This species reappeared in the trap in 1970. Poplar feeders however, are also in the ascendancy and a specially welcome one for 1971 was a female *Harpyia bifida* Brahm (the poplar kitten), a newcomer to the trap as also was *Amphipyra berbera* Rungs (the dusky copper underwing), now discovered to be quite widespread in the Area. A more detailed account of captures of note in the trap at

Buckingham Palace will be given in the separate analysis for Inner London. There seems definite evidence from the results of this light-trapping in the garden of the Palace over the years that more recently there has been a general increase in the diversity of species of moths with a number of surprise captures for Central London, as already indicated. Dr J. D. Bradley, who supervises the trap and has charge of analysing its contents, is quite sure that the appearance of these unexpected insects and the general increase in numbers of individuals and species is due to the fact that the now smokeless zone of the Metropolis has not only encouraged the growth of various and new forms of vegetation, but also through lack of foliage contamination with soot and other forms of pollution the larvae of a number of species have found a much more favourable environment in which to breed. This seems a logical explanation of this apparently steady addition of species not normally seen in such urban areas.

Among a few more records worthy of note before starting the vice-county analyses was the capture of the small migrant geometer moth, *Rhodometra sacraria* L. (the vestal) by Mr C. B. Ashby at Cheam in August 1971. This little insect is always a very welcome visitor to the Area and was one of the few migrants reported in the British Isles during 1971. Though *Aprophyla nigra* Haworth (the black rustic) is a prevalent insect in the western half of the Area, it is very rare in Kent (v.c. 16). It is therefore of especial interest that at least two have found their way into the light-traps of Mr C. G. Bruce at Lee and of Mr D. O'Keeffe at Bexley, both in 1971, indicating the definite gradual spread eastwards of this handsome autumn moth. Mr O'Keeffe has found a flourishing colony of *Cirrhis ocellaris* Borkh. (the pale lemon sallow) at Bexley along the River Cray where larvae were abundant in black poplar in 1970 and again in 1971. This autumnal insect was first recorded in that region in the *Victoria History* as far back as 1908, but since then seems to have been undetected till quite recently.

In the analyses of records for the respective vice-county regions and Inner London, a number of species new to them have occurred and as in previous reviews these are denoted by an asterisk (*).

As usual INNER LONDON leads the list. The prevalence of *Celastrina argiolus* L. (the holly blue) has already been mentioned and this new abundance has been well borne out by Mr C. A. Clarke who saw these little butterflies in numbers in Chelsea Physic Garden on 30 July 1971 (*Entomologist's Rec. J. Var.* **83:** 394). I myself saw one of this species at South Kensington Station on 9 August of that year. Other records of butterflies in the central area include *Pieris brassicae* L. (the large white), *P. rapae* L. (the small white), *Aglais urticae* L. (the small tortoiseshell) and *Inachis io* L. (the peacock) all observed within a hundred yards of the Mansion House in the City by Mr J. A. C. Greenwood in August 1971. A little later he saw a *Heodes phlaeas* L. (the small copper) sunning itself on a shop window in Cheapside, really quite a galaxy in one of the busiest traffic spots anywhere (*Entomologist's Rec. J. Var.* **83:** 346).

Returning to a more detailed report of the Buckingham Palace trap records, it is interesting how many species not only new to that locality, but also to Inner London, have come to light during the past two years, with a few dating from the 1968 and 1969 period. In the first category is the female *Harpyia bifida* Brahm (the poplar kitten) already referred to for 1971. The only other record of this fine insect for central London was of one taken in a trap at the Zoo, Regent's Park in 1953. Another welcome visitor was the very pretty *Thyatira batis* L. (the peach blossom)* taken in July 1970, while *Drepana binaria* Hufn. (the oak hooktip) and *Earias clorana* (the cream bordered pea) both reappeared in 1968 and have not since been noted. *Phragmatobia fuliginosa* L. (the ruby tiger) was once more taken in 1971. Among noctuid moths that had not been seen before were *Lycophotia varia* Vill. (the true lover's knot)*, first noted in 1969, and also *Thalera cespitis* F. (the hedge rustic)* taken in 1970, while another noteworthy visitor was *Aporophyla nigra* Haworth (the black rustic)*, seen in 1968. All three species are most unexpected in this part of the Metropolis. *Amphipyra berbera* Rungs (the dusky copper underwing), only recently separated from *A. pyramidea* L. (the copper underwing) was taken in the trap for the first time in 1968 before the two insects had been recognised. Another specimen of *Parastichtis suspecta* Hübn. (the suspected) turned up during 1970 with one previous record for the trap in 1963. *Apamea ophiogramma* Esp. (the double-lobed) though a well-known London insect, appeared in the trap for the first time in 1970. The geometrids provided some very interesting newcomers for Inner London. Notably three species, *Sterrha inornata* Haworth (the plain wave)* in 1971, *Euphyia unangulata* Haworth (the sharp-angled carpet)* and *Plemyria bicolorata* Hufn. (the blue-bordered carpet)*, both in 1970. The last feeds on alder which occurs in the garden. Two quite common moths not seen before in this part of London were *Hemithea aestivaria* Hübn. (the common emerald)* in 1970, and *Deilinia exanthemata* Scop. (the common wave)* in 1969. A further example of the small migrant *Nycterosia obstipata* F. (the gem) was also recorded in 1969.

For MIDDLESEX (v.c. 21) the most noteworthy butterfly was *Nymphalis antiopa* L. (the Camberwell beauty) taken in South Harrow on 31 August 1970 by Mrs B. Houghton, already referred to in the introduction. *Pyrameis cardui* L. (the painted lady) has been especially scarce over the last two years, so that one seen on Hampstead Heath on 15 August 1970 by Mr R. Kettle is worthy of mention. According to Miss E. M. Chacksfield *Polyommatus icarus* Rott. (the common blue) was very numerous near the Brent Flyover in August 1971.

Among the moths Mr G. Prior's capture of *Eustrotia bankiana* F.

(the silver-barred)* is remarkable for v.c. 21, especially in such a built-up region as North Harrow. This little insect, also new to the Area, is mentioned in more detail in an earlier paragraph. The small black noctuid *Parascotia fuliginaria* L. (the waved black) seems to be spreading north of London because Mr Prior took it in his trap in North Harrow in 1971. The appearance of *Procris statices* L. (the forester) at Northwood is another unexpected discovery by Mr Prior who also reports the following geometrids worthy of mention from North Harrow: *Lobophora halterata* Hufn. (the seraphim), *Sterrha emarginata* L. (the small scallop) and *Lygris pyraliata* Schiff. (the barred straw), all none too common for v.c. 21, while the forester had only one other record, at Kenton. Yet another surprise for this vice-county was *Hapalotis venustula* Hübn. (the rosy marbled)* at Hampton on 19 June 1970. This tiny noctuid which graced the trap of Mr E. W. Classey seems to be spreading rapidly in the Home Counties.

Several collectors have kindly sent in a number of useful records for HERTS (v.c. 20). Of these Mr R. I. Lorimer's melanic *Catocala nupta* L. (the red underwing) from Totteridge in 1970 is the most spectacular. Also in that year he identified his first *Amphipyra berbera* Rungs (the dusky copper underwing) in that locality. This newly recognised species was in about the proportion of 1: 7 with *A. pyramidea* L. (the copper underwing). *Apatele alni* L. (the alder) was in spate during 1970 at Totteridge, with examples of the melanic *ab. steinarti* out of a total of twenty normal insects. The melanic *ab. nigrofulvata* of *Semiothisa liturata* Clerck (the tawny barred angle) is now the prevalent form there. Melanism there is also on the increase with dark forms of *Tethea ocularis* L. forming eighty per cent. of the population. Melanic forms of *Polia nebulosa* Hufn. (the grey arches) and of *Gonodontis bidentata* Clerck (the scalloped hazel) appeared for the first time in 1971, with some uncommon visitors such as *Notodonta trepida* Esp. (the great prominent), *Apamea ophiogramma* Esp. (the double-lobed) and *Caradrina ambigua* Schiff. (Vine's rustic), while *Hypena rostralis* L. (the buttoned snout) reappeared after twenty years. *Zeuzera pyrina* L. (the leopard) was unusually common in 1971.

From Bushey Mr Barry Goater reports the arrival of *Hadena compta* Schiff. (the varied coronet) in July 1971. Other newcomers to his garden and to the district over the two years have included *Hadena conspersa* Schiff. (the marbled coronet), *Rheumaptera cervinalis* Scop. (the scarce tissue), *Perizoma affinitata* Stephens (the large rivulet), *Bapta bimaculata* F. (the white pinion-spotted), *Eupithecia tantillaria* Boisd. (the dwarf pug) and *Hemistola immaculata* Thunb. (the lesser emerald). Currant stems containing larvae of the tiny *Aegeria tipuliformis* Clerck (the currant clearwing) were found on the local allotments in June 1970 and successfully bred through.

Mr G. Prior has also sent in a number of records from Borehamwood, near Rickmansworth. Here he noted *Epirrhoe galiata* Hübn. (the galium carpet) for which there are only a few records for v.c. 20. Other geometrids observed in this locality in 1970 and 1971 included *Ligdia adustata* Schiff. (the scorched carpet), *Orthonama lignata* Hübn. (the oblique carpet), *Eupithecia succenturiata* L. (the bordered pug). *Chloroclystis coronata* Hübn. (the v-pug) and *Lygris fulvata* Forst. (the barred yellow).

Once more no records have been forthcoming from NORTH ESSEX (v.c. 19), the smallest vice-county region of the Area. It has potentialities as it borders on part of Epping Forest but it is unfortunate that it should be so little surveyed.

For SOUTH ESSEX (v.c. 18) Mr K. W. Grimwood has sent in again a most comprehensive list of captures for the past three years in his trap at Ingrave near Brentwood. It is noteworthy that a good many species hitherto quite scarce in the district have now reappeared. Among these is *Pararge aegeria* L. (the speckled wood) which was observed in both 1970 and 1971 after an absence of two years.

The holly blue was very numerous in both years in which very few red admirals and painted ladies were seen. Among a most impressive list of 278 moths covering the last three years an interesting capture for 1971 was the form of *Zygaena filipendulae* L. (the six-spot burnet) with yellow instead of red spots on the hindwings, always a great rarity. Nearly all the species recorded for 1968 and 1969 reappeared during the subsequent two years. A newcomer, however, seems to have been *Leucoma salicis* L. (the white satin), as also were *Miltochrista miniata* Forst. (the rosy footman), *Hadena suasa* Schiff. (the dog's tooth) and *Tiliacea citrago* L. (the orange sallow), all of which came to the trap for the first time in 1971. Among the scarcer visitors was *Spaelotis ravida* Hübn. (the stout dart), also *Gastropacha quercifolia* L. (the lappet) and *Diarsia dahlii* Hübn. (the barred chestnut) which seems well established in that area. A generally widespread species *Lycophotia varia* Vill. (the true lover's knot)*, oddly enough does not seem to have been recorded before for v.c. 18, though Mr Grimwood has had it for the past three years. *Procris statices* L. (the forester) occurs in quite a flourishing colony recently discovered in one part of the vice-county. *Hadena compta* Schiff. (the varied coronet) is now a definite resident throughout that part of Essex. Other welcome reappearances during the past two years have been those of the following species: *Arctia villica* L. (the cream-spot tiger), *Eilema complana* L. (the scarce footman), *Eremobia ochroleuca* Esp. (the dusky sallow), *Graptolitha ornithopus* Hufn. (the grey shoulder knot), and among the geometrids *Ennomos autumnaria* Wern. (the large thorn), *Selenia lunaria* Schiff. (the lunar thorn) and *Bapta distinctata* H.-S. (the sloe carpet), while the presence of *Eupithecia succenturiata* L. (the bordered pug)* would seem to be new for v.c. 18. Other species in the list with very few previous records for the vice-county include *Drepana binaria* Hufn. (the oak hooktip), *Drepana cultraria* F. (the barred hooktip), *Euproctis chrysorrhaea* L. (the brown-tail), *Harpyia bifida* Brahm. (the poplar kitten), *Rhizedra lutosa* Hübn. (the large wainscot), *Apamea anceps* Hübn. (the large nutmeg), *Tiliacea aurago* F. (the barred sallow), *Ligdia adustata* Schiff. (the scorched carpet), *Epione repandaria* Hufn. (the bordered beauty), while both *Euschesis interjecta* Hübn. (the least yellow underwing)* and *Semiothia liturata* Clerck (the tawny barred angle)* are also apparently new for v.c. 18.

As before Mr D. O'Keeffe reports some interesting records for WEST KENT (v.c. 16) from his home at Bexley. He mentions that *Hadena compta* Schiff. (the varied coronet) is now of regular occurrence in his area and that the larvae infest *Dianthus barbatus* (sweet william) in his garden. A few years ago this insect was unknown in this region. Another species which has greatly increased with him is *Cirrhia ocellaris* Borkh. (the pale lemon sallow) which is now annually abundant in the larval state in the catkins of black poplars along the River Cray. A specimen of *Aporophyea nigra* Haworth (the black rustic) in October 1971 was quite a notable event for v.c. 16 as it is still a rarity in this region, as also was the appearance of *Amathes ditrapezium* Borkh. (the triple spotted clay) in 1970, but it seems this latter insect is now on the ascendancy there. *Cucullia asteris* Schiff. (the starwort shark) and *Cucullia absinthii* L. (the wormwood shark) maintained their footholds in the district.

From nearby at Dartford Mr B. K. West lists a number of *Parascotia fuliginaria* L. (the waved black) in 1971, an insect which is definitely colonising that part of Kent. Another rarity noted was the appearance of *Gortyna petasitis* Doubleday (the butterbur) of which there are only apparently three other records for v.c. 16. Other species seen in the 1970 and 1971 for which there seem to be only old records include *Comacla senex* Hübn. (the round winged muslin), *Craniophora ligustri* F. (the coronet), and *Xanthorhoe quadrifasciaria* Clerck (the large twin-spot carpet). Further noteworthy captures were an *Apatele alni* L. (the alder)*, apparently new to v.c. 16, taken in June 1970 and also a female *Saturnia pavonia* L. (the emperor) in May 1970, and for 1971 *Lygephila pastinum* Treits. (the blackneck), *Zenobia subtusa* F. (the olive kidney), *Lophopteryx cucullina* Schiff. (the maple prominent), and *Panolis flammea* Schiff. (the pine beauty).

From Lee Mr C. G. Bruce records a further Kent record of *Aporophyla nigra* Haworth (the black rustic) in October 1970 and a hibernated *Lithophane semibrunnea* Haworth (the tawny pinion) in May 1970, an insect with very few previous records for v.c. 16. Records from West Wickham sent in by Mr M. Chalmers-Hunt during 1971 comprise *Eilema deplana* Esp. (the buff footman)*, *Leucania pudorina* Schiff. (the striped wainscot), *Polia nitens* Haworth (the pale shining brown), *Laspeyria flexula* Schiff. (the beautiful hooktip), and *Eupithecia satyrata* Hübn. (the satyr pug)*, yet another novelty for v.c. 16. Another rare visitor to West Wickham was a *Biston betularia* L. (the peppered moth) *ab. grisea* Smith, on 4 July 1971. In this form the black peppering is replaced by pale grey coloration (vide *Entomologist's Rec. J. Var.* **83**: 282). Mention has already been made of the brown form of *Catocala nupta* L. (the red underwing) taken by Mr P. Sokoloff in August 1971 at Orpington, where a record has come to light of a *Harpyia bicuspis* Borkh. (the alder kitten) taken in 1966 by Mr I. Watkinson.

From Selsdon in SURREY (v.c. 17) Mr E. H. Wild reports in June 1970 the alder kitten, already noted, with only one other record for this vice-county. Also in 1971 *Polia nitens* Haworth (the pale shining brown), *Hadena compta* Schiff. (the varied coronet) and *Sterrha vulpinaria* F. (the least carpet), the last with only one previous record for v.c. 17, from Dulwich in 1957. This little moth was taken by Miss Marshall at Waddon in Croydon and is evidence of its spread.

Reference too has previously been made to two further rarities *Lampides boeticus* L. (the long-tailed blue) near Wisley in September 1971 and to *Calophasia lunula* Hufn. (the toadflax brocade) at Bookham in July 1970. Other migrants include *Herse convolvuli* L. (the convolvulus hawk) seen by Mr M. Klein at Coulsdon on 9 September 1970, one of the few of this sphingid noted for the period under review. At Cheam on 27 August 1971 Mr C. B. Ashby took *Rhodometra sacraria* L. (the vestal), again very scarce in the past two years.

In the West Norwood district Mr B. Skinner has noted the comparative abundance of *Plusia festucae* L. (the gold spot) in 1970. *Hypena rostralis* L. (the buttoned snout) reappeared in 1970 after many seasons. In 1971 he took there *Apamea unanimis* Hübn. (the small clouded brindle) and *Celaena leucostigma* Hübn. (the crescent) as well as the little *Perizoma bifaciata* Haworth (the barred rivulet). On Mitcham Common in 1971 he found stems of reed riddled with the larvae of *Apamea ophiogramma* Esp. (the double-lobed). He also took *Eustrotia uncula* Clerck (the silver hook) on the Common in August 1971.

From the Reigate area Mr D. Trembath says that he had several *Antitype flavicincta* F. (the large ranunculus) in 1970 and again in 1971, while *Apatele alni* L. (the alder) was very common in June 1970. Also *Lysandra bellargus* Rott. (the adonis blue) was abundant on the Downs bordering the southern boundary of the Area near Dorking in June 1971.

In 1971 Professor J. V. Dacie published a supplement to his moths of Wimbledon (vide *Entomologist's Rec. J. Var.* **83:** 204) which has been brought up-to-date from the original list which appeared in 1962. In the recent list he enumerates thirty-two species not previously recorded by him. Some of these have been noted in this review for the intervening years, but there have been a number of interesting additions during 1970. These include *Hyloicus pinastri* L. (the pine hawk) in July of that year. This fine moth is steadily penetrating the London Area. Other species worthy of note for 1970 were *Euschesis interjecta* Hübn. (the least yellow underwing), *Cosmia diffinis* L. (the white-spotted pinion), *Chesias legatella* Schiff. (the streak), and *Ectropis crepuscularia* Schiff. (the lesser engrailed), but for 1971 the only newcomers were *Harpyia furcula* L. (the sallow kitten), new to Wimbledon, and *Lygris fulvata* Forst. (the barred yellow).

A most impressive list has been submitted by Mr P. J. Baker who has recently gone to live almost on the Area boundary between Thorpe and Virginia Water. Reference has already been made to his two most outstanding records there, that of *Leucania unipunctata* Haworth (the white-speck wainscot) in October 1971 and of *Oria musculosa* Hübn. (the Brighton wainscot) in August 1970 with only one earlier record in the Area, at Weybridge in 1953. A rare species for v.c. 17 is *Leucoma salicis* L. (the white satin) of which three came to light in 1970. *Arctia villica* L. (the cream-spot tiger), *Odontosia carmelita* Esp. (the scarce prominent) and *Eilema deplana* Esp. (the buff footman) were also uncommon visitors for that part of Surrey. Some of the noctuid species were most unexpected such as *Hadena conspersa* Esp. (the marbled coronet), a chalk and sandhill insect; also *Heliothis maritima* Graslin (the fulvous clover) from heathland and *Chilodes maritima* Treits. (the silky wainscot) from a thick reed-bed, each type of terrain being far removed from the site of capture. Other moths seldom seen in that district included *Anaplectoides prasina* F. (the green arches), *Hadena lepida* Esp. (the tawny shears), *Agrotis vestigialis* Rott. (the archer's dart), *Aparele alni* L. (the alder) with one in 1970, and *Cirrhia ocellaris* Borkh. (the pale lemon sallow), a new locality for this very local insect. Further scarce noctuids were *Lithophane semibrunnea* Haworth (the tawny pinion), *Spaelotis ravida* Hübn. (the stout dart), two in 1970, *Dasycampa rubiginea* F. (the dotted chestnut) and the little *Hapalotis venustula* Hübn. (the rosy marbled), a new arrival in the district. The geometrids provided an equally remarkable series. One new to v.c. 17 was *Xanthorhoe biriviata* Borkh. (the balsam carpet)* only discovered in the British Isles in 1955, but found more recently along canals just outside the boundary of the Area in north-west Surrey. Yet another unusual insect was *Melanthia procellata* F. (the pretty chalk carpet), normally a denizen of the Downs where its larva feeds on traveller's joy (*Clematis vitalba*). Another moth with similar habitat was *Horisme vitalbata* Hübn. (the small waved amber). Other visitors such as *Thera firmata* Hübn. (the pine carpet), *Abraxas sylvata* Scop. (the clouded magpie), *Eupithecia venosata* F. (the netted pug) and *Gnophos obscurata* Schiff. (the annulet) only occurred singly in the trap and are all uncommon in this part of Surrey.

Among the butterflies in this region Mr Baker saw several *Strymonidia w-album* Knoch. (the white-letter hairstreak) in July

1970 near Thorpe, while Mr W. G. Tremewan noted a single specimen near Chertsey in the same year. Further east in the vice-county Mr Chalmers-Hunt reports two *Cupido minimus* Fuessl. (the small blue) near Addington in June 1970.

As usual for BUCKS (v.c. 24) Sir Eric Ansorge has sent in several records of species new to his area at Chalfont St Peter all taken in 1970 in which year *Apatele alni* L. (the alder)* was in spate, and visited his trap for the first time with a half-dozen examples. *Eilema griseola* Hübn. (the dingy footman)* was another newcomer as was also *Apamea scolopacina* Esp. (the slender brindle)* and *Eremobia ochroleuca* Esp. (the dusky sallow)*. The second *Parascotia fuliginaria* L. (the waved black) for the district appeared in July 1970 as well as his second record of *Aporophyla nigra* Haworth (the black rustic) in October of that year. There were also a couple of *Harpyia furcula* Clerck (the sallow kitten) and also *Episema caeruleocephala* L. (the figure of eight) in October 1970. He mentions that 1971 was a much less productive year at Chalfont with very few red admirals and no painted ladies, though several holly blues. Among the rather meagre number of moths at light were a few *Apatele alni* L. (the alder), *Apamea hepatica* L. (the clouded brindle), *Lygephila pastinum* Treits. (the blackneck) and *Semiothisa notata* L. (the peacock), all uncommon in that area.

Up to the end of 1971 the total number of species of macrolepidoptera for the London Area would appear to stand at 729, out of 935 valid species recognised for the whole of the British Isles. The percentage therefore remains just short of 78.

Survey of Bookham Common

THIRTIETH YEAR

Progress Report for 1971

General (G. Beven)

The survey team was very pleased to act as hosts to several societies visiting the Common during the year, including the South-west Middlesex Section of the L.N.H.S. on 22 May, the Weybridge Natural History and Aquarists' Society on 13 June, the Leatherhead History Society on 26 June, and the Quekett Microscopical Club on 11 July.

A. E. Le Gros has compiled "notes on the insect fauna of Bookham for survey workers", a copy of which has been placed in the Research Hut library. In these notes he gives the references to published records and suggests the most useful standard works for identification. He has also presented to the library a collection of Xerox copies he has made of the accounts of meetings of the British Entomological Society on Bookham Common since 1902. We are also most grateful to Dr A. S. Thorley for arranging the erection of a netting screen to protect the Research Hut windows, and also to Phillip Palmer for kindly making an enlargement of a 1968 aerial photograph of the Common, to be kept in the Hut.

Pollution (G. Beven)

Forty gallons of paint stripper were emptied in error into the Isle of Wight ditch just off the Common (Sq. 88) on 5 July 1971. The water became milky and smelt strongly. Dead fish were found in Bookham Stream and the River Mole next day. On 11 July J. W. Coles examined the water at ref. 857 and found dead dipterous larvae but no signs of life except for one mite *Oribatella quadricarinata* (Michaei), identified by K. H. Hyatt. This is not an aquatic mite and could easily have blown into the stream by accident. The only living creatures which A. E. Le Gros could find on this date at ref. 811 were *Simulium* dipterous larvae. Several live water beetles were present at ref. 815. The water looked clear and did not smell. On 5 September J. W. Coles found a beetle larva, diptera larvae, a *Chaetogaster* sp. (*Oligochaeta*) and a *Plectus* sp. (*Nematoda*) alive. He reports that by 12 September conditions seemed to have returned to normal. Samples taken then included two living *Agabus didymus* Olivier, family *Dytiscidae*, identified by M. J. D. Brendell.

Vegetation (Ella M. Hillman)

1. Revision of the plant list. This has not progressed steadily and without interruption, but thanks to Dr A. S. Thorley and R. Stern who have made extra visits, and by concentrating effort on trees

and shrubs, enough data have accumulated on the card index of records (kept by E.M.H.) to enable a short paper on the changes in the distribution of these species to be produced in this issue.

The recording of other species is too slow at present; more recorders are needed, but perhaps by again concentrating on a special group of plants some worthwhile results may be obtained.

2. Survey of *Ruscus aculeatus* (butcher's broom). Mrs A. Warren is carrying this out almost single-handed in the field, and E.M.H. has visited the British Museum (Natural History) library to collect information on this species, about which some contradictory statements have been made. With the help of Dr P. Yeo of the University Botanic Gardens, Cambridge, to whom we are most grateful, the chief difficulties have now been met. Interesting facts are emerging concerning flowering periods, fructification, and manner of growth; in all about sixty clumps have been mapped and examined. Pollinating agents of this winter-flowering species remain a mystery to be solved, and there is an opportunity here for any interested entomologist. It is hoped to produce a full report at the end of 1972.

3. Control of bracken *Pteridium aquilinum*. As P. A. Moxey has been unable, owing to pressure of work, to visit the quadrats on Eastern Plain for comparison of cut and uncut bracken areas, there is no report for 1971.

4. Ponds and marshy areas. As plans are being made by the National Trust for the clearing of the Isle of Wight Pond and the chain of ponds draining into it, the botanical team interrupted its work of tree recording to produce a brief report for the Bookham Commons Management Committee. Much of the aquatic flora has disappeared, and this is probably caused by an accumulation of decayed matter in the ponds. It was found that the most interesting marshy areas are near Upper Eastern Pond and on Isle of Wight Plain, but these areas are shrinking, perhaps as a result of improved drainage, and recommendations were made for their conservation. Upper Eastern Pond is the only station on the Common for *Equisetum fluviatile*, but this plant has now spread so as to cover the greater part of the pond, and some control is needed.

5. Other observations. (a) D. Macer-Wright, Hon. Commons Manager for the National Trust, pointed out an area on Western Plain in which bracken was shrivelling in early August. The decay was found to be due to fungal attack by an undescribed species of *Phoma*, as determined by the Commonwealth Mycological Institute. Similar attacks were noticed in Kent and Sussex by survey members, and two others had been reported to the Institute. There was a freak frost in southern areas on the night of 17/18 July, and this may have injured the bracken and made it liable to fungal attack. (b) Two species not previously recorded were noticed this year on the Common: cherry plum *Prunus cerasifera* by Miss M. E. Robins, and eared willow *Salix aurita* by R. Stern.

Thanks are expressed to all the recorders named above and to Miss J. Stoddart for regular field work, and to others who have helped occasionally with plant recording.

Insects (General) (A. E. Le Gros)

Attention is being given to the plant galls, leaf mines and insects associated with birch, hazel and pedunculate oak. In particular the *Cecidomyiidae* (gall-midges) and the *Auchenorhyncha* (leaf-hoppers) are to be studied. A preliminary account of the gall-midges of the pedunculate oak is given elsewhere. A list of seventy-eight leaf-hoppers has been received from Mr D. Collins.

The writer is acting as recorder of the micro-moths of Bookham and would like records from members so that the meagre list of fifty-six species compiled to date from published and other sources may be greatly extended.

Mecoptera (A. E. Le Gros)

In 1904 *Panorpa germanica* L. was recorded from Bookham but in the last twenty-five years only the common scorpion-fly *P. communis* L., common from May-July, has been seen. This insect thrives in thick undergrowth, abounding in bramble cover on the edges of the woods and at the side of woodland paths. In 1971 it was seen in the untidy vegetation surrounding some of the gun pits on Eastern Plain.

Diptera (A. E. Le Gros)

The following additions are made to the lists published by Parmenter:

Culicidae. Aedes cinereus Mg. Reared from larvae from Gun Pit F on 10 May 1970. *Dixa amphibia* De Geer. Reared from larvae collected in September 1969 from Lower Eastern Pond and Sheepbell Pond, and from Lower Eastern Pond in April 1970. *Mochlonyx culiciformis* (De Geer). The larva of this species was common in the gunpits in spring 1970 and 1971.

Psychodidae. Psychoda albipennis Zett., *P. parthenogenetica* Tonnoir and *P. spreta* Tonnoir. These three species were swept from the Hollows in May-June 1965.

Pipunculidae. Mr A. M. Hutson tells me that there are specimens of two species in the Parmenter collection that have not been recorded. These are *Cephalops titania* Coe, male and female, 10.ix.1961, LP, and *Eudorylea obliquus* Coe, females, 10.x.1948 and 20.vi.1960, LP.

Pitfall Trap Survey (M. Towns)

Some pitfall ground traps have been in operation since February 1970 on Eastern Plain and in an adjacent area of bracken. John

Coles, A. E. Le Gros, Derrick Hall and Michael Towns have been sorting large collections of invertebrates obtained by these traps. Eastern Plain had been overrun by bracken and attempts are being made to eradicate it. This provides an opportunity to record invertebrate colonisation. The bracken traps are being used to give a "species baseline" for comparison with yields from the Eastern Plain traps. Help from other members, both in trapping and sorting the collections, would be most welcome. A large variety of creatures have been caught, including woodlice, centipedes, millipedes, earthworms, nematodes, ants, bees and wasps, flies, spiders, mites, harvestmen, springtails, beetles, plant bugs and ground hoppers.

Birds (G. Beven)

Oak-wood (Eastern Wood)

The breeding season census was repeated in this sixteen hectare (forty acre) sample of dense interior oak-wood. The number of territories of singing males of selected species over the last nine years was as follows:

	1963	1964	1965	1966	1967	1968	1969	1970	1971
Great tit	12	17	17	12	16	19	14	13	13
Blue tit	19	19	22	17	16	20	19	20	15
Coal tit	2	5	4	3	8	6	7	5	4
Marsh tit	3	1	1	3	3	3	3	3	2
Long-tailed tit	0	0	1	2	2	1	1	2	3
Nuthatch	2	5	5	5	7	5	3	5	5
Tree creeper	1	1	2	2	2	4	4	3	5
Wren	1	5·5	11	17	25	26	24	25	17
Mistle thrush	2	2	3	2	1	1	2	2	2
Song thrush	4	7	7	8	10	7	7	7	9
Blackbird	8	10	12	11	12	11	13	9	14
Robin	21·5	32	37	37	42	43	44	36	44
Blackcap	5	3	4	7	6	3	6	1	3
Garden warbler	2	2	4	1	1	1	1	1	0
Willow warbler	2·5	1·5	4	4	2	6	2	2	0
Chiffchaff	2	5	7	6	6	3	3	4	1
Dunnock	4	5	5	4	8	6	6	3	2
Starling	5	5·5	10	6	8	12	7	8	8
Chaffinch	5·5	7	8	7	6	4	4	3	6

The decrease in the wren population is interesting. The previous winter was not particularly cold, in fact we classified it as fairly mild. The population had been very high for four years, with territories compressed to about one-and-a-half acres, which seems to be about as small as the bird will tolerate, minimum territory sizes in woodland being given as one-and-a-half to two acres by E. A. Armstrong (1955. *The Wren.* London). The blackbird population seems to be the highest for the last twenty-six years (no counts were made in 1947, 1948, and 1957) and the robin numbers remain apparently maximal. The chaffinch population continues to wax and wane, now rising again for the third time since 1946.

Scrub and Grassland

The spring census of the number of territories of singing males was again made on thirty-nine hectares (ninety-six acres) of scrub and grassland in 1971 (G. B. and W. D. Melluish). The number of territories of selected species over the last eight years was as follows:

	1964	1965	1966	1967	1968	1969	1970	1971
Pheasant	2	2	3	3	2	7	3	5
Wood pigeon	1	2	4	1	1	6	3	5
Turtle dove	5	4	3	5	3	7	4	8
Green woodpecker	0	1	4	4	4	1	1	1
Long-tailed tit	2	3	4	5	6	6	5	4
Wren	2	3	9	10	15	14	18	14
Song thrush	8	8	7	10	9	9	14	15
Blackbird	15	8	13	17	15	15	20	15
Robin	23	23	15	21	23	23	22	18
Nightingale	1	0	2	3	4	4	5	4
Grasshopper warbler	2	4	6	4	5	6	5	5
Whitethroat	12	17	17	22	16	11	14	12
Willow warbler	20	14	19	27	21	26	14	18
Dunnock	11	15	13	18	12	12	13	10
Linnet	1	4	4	4	1	2	0	1
Redpoll	2	3	5	4	4	6	6	4
Chaffinch	18	13	13	14	9	12	17	11
Yellowhammer	9	7	9	7	8	7	5	8
Reed bunting	3	2	5	6	5	3	3	5

Under the policy of conservation management about thirty acres of scrub have been partially cleared from various parts of these ninety-six acres since 1959. In 1969, 1970 and 1971 about seven-and-a-half hectares (eighteen acres) of the long grass have been repeatedly cut. During these thirteen years, in spite of scrub clearances of one fifth or more of the scrubland, it is interesting to find that apparently long-tailed tits, wrens, robins, nightingales, grasshopper warblers, dunnocks and chaffinches have all increased, the yellowhammer numbers have remained much the same, while whitethroats, willow warblers and reed buntings have decreased. (See also *Surrey Bird Report* **18** : 17-20 (1971).)

Other Notes on the Birds

At least one little grebe was present in the spring, and two pairs of mandarin ducks were observed about the ponds in November and December. A pair of mute swans nested on the Isle of Wight Pond, successfully conducting their three cygnets in due course to a pond in the village. At least one woodcock was roding in the spring, four young in down being discovered by Michael Towns in Central Wood (527) on 11 April 1971. A greenshank flew across Western Plain on 8 August 1971 (D. V. Freshwater). One barn owl pellet on Kelsey's Farm, just north of the Common, contained bones of two field voles and a small passerine bird. At least two tawny owls hooted in the spring, but there were probably more as few observations were made at night. Lesser spotted woodpeckers were recorded on or near the Common in each month from July to December. The number of pairs of long-tailed tits during spring in an area of about forty-nine hectares (120 acres) of grassland and scrub during 1971 was four. There were four singing nightingales in the spring, and a young bird was seen being fed on 13 June 1971. There were five singing grasshopper warblers, and a wood warbler sang in Sheepbell Wood (329) on 18 May 1971. Two male tree pipits were singing on Western Plain on 19 April 1971 (K. Gold) but apparently did not remain there. A hawfinch was eating haws on 12 December 1971.

Mammals (M. Towns)

A dead badger was discovered on the railway line in Great Mornshill Wood, just off the Common, near Bayfield in September 1971 (M. Towns).

David Warren is making a survey of water voles. So far he has been mapping their distribution and their burrows along the water courses.

Michael Towns is examining the faeces of fox, rabbit and water vole for the presence of ova and oocysts of some intestinal parasites.

Changes in the Distribution of Trees and Shrubs on Bookham Common, 1953 - 1971

by E. M. Hillman

Summary

The twenty lettered areas on the vegetation map of Bookham Common are used to indicate the distribution of trees and shrubs.

A table of the forty-three species which were not present in all twenty areas in 1953 is presented, listing the new areas in which each appears in a 1968-1971 census, and showing the net increase in the number of areas as a measure of the increase of its range on the Common.

The areas are compared. All but two have gained from one to thirteen species. A new woodland is developing on the west side of Bayfield Plain where no scrub clearance has taken place.

Forty-three distribution maps, of which twenty-two are illustrated, give information on the most usual distance of the dispersal of trees and shrubs from their origins on the Common during eighteen years. Wind and animals are of equal importance as dispersal agents. Vegetative propagation alone may result in local abundance, but not, in eighteen years, in a widespread distribution.

The species are compared. About half of the forty-three species have extended into three or more areas. Five species have lost ground. Of casuals and escapes not included, four are no longer found and four remain rare and confined to their original locations in one area each. Notes on some individual species are given.

Introduction

In 1953 a list of vascular plants of Bookham Common was compiled by A. W. Jones and his team (Jones 1954) and their distribution was indicated by dividing the Common into twenty areas, usually of about 8 hectares (20 acres) each, lettered A - T. Their abundance was also assessed. The present survey from 1968-1971 was carried out by a team of observers. Dr A. S. Thorley has been able to make extra visits, and without the data accruing from these the number of observations would be insufficient. R. Stern, a Forest Officer, has also made extra visits, and a considerable contribution in recording all kinds of plants. His valuable knowledge and experience have been available to the rest of the team, and I am indebted to him for almost all the comments on abundance and status of the species in this paper and for other ideas in sentences followed by his initials. Miss J. Stoddart, Miss M. E. Robins and the author have recorded regularly. Mrs A. Warren and Dr G. Beven have added a few records to the list.

Maps for the forty-three species in Table 1 have been drawn, showing (a) the areas in which they occurred in 1953 and again in 1968-1971, (b) those in which they have been found in 1968-1971 but not formerly, (c) those in which they occurred in 1953 but from which there is no later record. Twenty-two of these are chosen to illustrate this paper; information on these and the remainder is given in Table 1 and below. Scientific names and order follow Clapham, Tutin and Warburg (1962).

TABLE 1. Changes in the distribution of trees and shrubs on Bookham Common, excluding those found in all twenty areas in 1953.

New areas are those from which the plant has been recorded in 1968-1971 only. The former areas are to be found in the plant list of 1953 (Jones 1954).

Tree or shrub	English name	New areas	Status			Net gain or loss (L) No. of areas
			No. of areas in 1953	No. of 1953 areas where now absent	No. of new areas in 1968-71	
Pinus sylvestris	Scots pine	S	1		+ 1	1
Taxus baccata	Yew	AEFINR	10	— 1	+ 6	5
Tilia x europaea	Lime	EQ	1		+ 2	2
Acer pseudoplatanus	Sycamore	HIJKLMOQT	9		+ 9	9
Acer platanoides	Norway maple	AERS	1		+ 4	4
Acer campestre	Common maple	CHINPQT	11	— 1	+ 7	6
Aesculus hippocastanum	Horse chestnut	ADFJS	5		+ 5	5
Ilex aquifolium	Holly	OP	17		+ 2	2
Euonymus europaeus	Spindle	BDHLNQS	7	— 2	+ 7	5
Frangula alnus	Alder buckthorn	GO	4	— 4	+ 2	(L) 2
Genista anglica	Petty whin	—	9	— 5		(L) 5
Ulex europaeus	Gorse	IT	10	— 1	+ 2	1
Ulex minor	Dwarf gorse	—	13	— 7		(L) 7
Sarothamnus scoparius	Broom	E	2	— 1	+ 1	0
Rubus idaeus	Raspberry	AGMNQRS	4	— 2	+ 7	5
Rosa arvensis	Field rose	ABCDGHIKMPQS	8		+12	12
Rosa canina agg.	Dog rose	DGMNPQS	7		+ 7	7
Prunus spinosa	Blackthorn	BL	18	— 1	+ 2	1
Prunus cerasifera	Cherry plum	DO	0		+ 2	2
Prunus domestica	Wild plum	E	0		+ 1	1
,, ,, ssp. *institia*	Bullace	O	1	— 1	+ 1	0
Prunus avium	Wild cherry	DMNS	2	— 1	+ 4	3
Crataegus oxyacanthoides	Midland hawthorn	FGHQ	3	— 2	+ 4	2
Sorbus aucuparia	Mountain ash	DFHIJKMS	5	— 1	+ 8	7
Malus sylvestris	Crab apple	AFGHOPQ	13	— 4	+ 7	3
Ribes rubrum agg.	Red currant	BCDEFGL	9	— 1	+ 7	6
Ribes nigrum	Black currant	Q	7	— 4	+ 1	(L) 3
Cornus sanguinea	Dogwood	BFOP	16		+ 4	4
Ulmus procera	English elm	—	9	— 1		(L) 1
Betula pendula	Silver birch	OP	18		+ 2	2
Betula pubescens	Downy birch	AFGIJOS	3	— 1	+ 7	6
Alnus glutinosa	Alder	S	0		+ 1	1
Carpinus betulus	Hornbeam	FGHIKLST	5	— 1	+ 8	7
Corylus avellana	Hazel	OPR	17		+ 3	3
Fagus sylvatica	Beech	FIKLNR	13	— 2	+ 6	4
Castanea sativa	Sweet chestnut	BCHLQS	2		+ 6	6
Quercus cerris	Turkey oak	JKOST	10		+ 5	5
Populus tremula	Aspen	BCDLOQR	10	— 3	+ 7	4
Fraxinus excelsior	Ash	KMST	16		+ 4	4
Ligustrum vulgare	Privet	P	5	— 1	+ 1	0
Sambucus nigra	Elder	GKM	17		+ 3	3
Viburnum opulus	Guelder rose	GNQR	3	— 3	+ 4	1
Ruscus aculeatus	Butcher's broom	Q	16		+ 1	1

Bramble (*Rubus* spp.), hawthorn (*Crataegus monogyna*), pedunculate oak (*Quercus robur*), and willow (*Salix* spp.) were found in all twenty areas in 1953 and again in 1968-1971; they are widespread and common and will not be discussed further. Mock orange (*Philadelphus* sp.), gooseberry (*Ribes uva-crispa*), whitebeam (*Sorbus aria*) and *Cotoneaster simonsii* are casuals which have not been recorded since 1953 and are therefore omitted from further discussion. Snowberry (*Symphoricarpos rivularis*), garden privet (*Ligustrum ovalifolium*), white poplar (*Populus alba*) and cultivated rose (*Rosa* spp.) are planted trees or escapes from cultivation which have persisted but have not increased their range of one area; they, too, are omitted from further discussion.

The Areas

Most areas have lost some of their former species of trees and shrubs, but have gained others, and Table 2 shows the net gains.

The planting of a row of trees on a burnt area in 1957 is responsible for the fact that area S has the largest number of gains. These were listed at the time as cherry, beech, sycamore, hornbeam, laburnum, and alder (Castell & Jones 1958). The laburnum has probably not survived as it has not been found in the recent survey, and the "sycamores" would appear to have been Norway maples.

TABLE 2. The areas in order of numbers of species gained.

Net gain No. of species	Areas	Net gain No. of species	Areas	Net gain No. of species	Areas
13	S	8	D K	4	N R
11	O G	7	I	3	C T
10	Q	6	H L P	2	nil
9	F	5	A B	1	E
				—1	J M

Of the areas which have gained eight species or more, O and Q were formerly grassland and scrub types, but G, F, and D were mainly inner woodland and K was woodland bordering marshy or aquatic habitats. Thus the reception of new species by a section seems to be dependent on too many chance factors to be in any way correlated with its habitat type. One of these factors is the position of a section in relation to others, for it will be seen from the maps that the spread into new areas is nearly always into those adjacent to areas already colonised (e.g. horse chestnut), or into a chain of adjacent areas (e.g. hornbeam).

It is worth noting, too, that the only two sections, J and M, to have fewer species recorded in them now are those flanked by dwellings and containing car parking space. From houses and cars emerge not only humans but dogs to be taken for walks; whether these biotic factors are in any way responsible for the situation in these sections cannot be known without special study.

Area Q is of interest in that whereas it is still mainly a grassland and scrub habitat, not only have thirteen new species of tree or shrub come into it (the highest number, but with three species lost the net gain is ten), but two of these, midland hawthorn and butcher's broom, are essentially woodland species. In fact, a new woodland area is developing here on the Common, discontinuous with the existing woods. As it is on the western side of area Q, it might well be named Bayfield Copse or South-west Copse. In addition to the outward growth of hedgerows and trees from the boundary of the Common on the west, there must have been some colonisation which is attributable to the eastern woods by the usual agencies of birds, mammals, wind. The colonisation of the grassland (Plains) areas by scrub began as the grazing by farm animals diminished, to cease altogether in 1949. The space between this copse and the main woodland areas has, however, been the subject of much clearing by various methods over a period of many years, and the comparatively new copse in area Q may well illustrate what the whole of the Plains would look like had no clearing taken place. The older scrub areas are developing into oak "high forest"; the thorn species are the principal colonisers, together with birch and the two scrub willows in some areas; the oak becomes easily established in these conditions, competes very successfully and soon dominates. (R.S.)

Area O, also on the Plains, is encroached on chiefly from the east, but some dense shrub thickets in the west reached the stream and were then cleared. Another part of the Plains, area R, also contains Station Copse which has not greatly enlarged perhaps because of the clearing of scrub on its boundaries.

The Species

Care must be taken in interpreting the maps; they give no indication whatsoever of abundance, as an area is filled in regardless as to whether one or hundreds of individual plants occur in it. Nevertheless, looking at the results as a whole, it is reasonably certain that most of the trees are increasing their range on the Common, and Table 1 shows to what extent.

Five species, silver birch, dogwood, hazel, ash, and elder, which were found in sixteen sections or more in 1953 are now found in all twenty areas. As they have made the maximum possible extensions of their range by invading at most four areas they are not considered when comparing species regarding the amount of spread.

Of the remaining thirty-eight species, nineteen have added three or more areas to their range. The greatest spread has been that of the field rose adding twelve areas to its former eight, and the sycamore adding nine areas to nine. The only tree to be found in fewer areas than in 1953 is the English elm. It must be remembered that the number of new areas actually invaded is often more than the net gain, since allowance has been made for the fact when a species appears to be absent from its former locations. It is possible that it still exists there, but as recording progressed, special searches were made for missing species, and they were not found. It is, of course, difficult to search thoroughly even one of the twenty acre areas for every plant classed as a tree or shrub. In fact a few species must have been overlooked by the team of 1953, as trees over twenty years old are now recorded for the first time. These records are few, of the order of one per area (R.S.), and it seems likely when all conditions are taken into consideration that the net gain figures show no more than the minimum extensions in range for most species, except perhaps for the Turkey oak.

As has been stated, a new section for a species is usually adjacent to the one in which it already occurs. This is not attributable to vegetative propagation. Although this method of reaching an adjacent area cannot be entirely ruled out, success thereby would depend on the position of the parent plant in its area, the direction of the suckering roots and their rate of growth, and perhaps the most important element in this context, their ability to cross boundaries between sections, which consist of well-used paths and streams. It is noticed that the stands of holly in the woods which are formed largely by vegetative reproduction are usually each contained within an area and do not continue on the other side of boundary paths. The main agents of dispersal into new areas at Bookham are animals, chiefly birds, and the wind, and the proportion of trees and shrubs which use these agents in the whole Bookham population of these species is about 2½ : 1. The proportion among the species now to be found in 20 or 19 sections is also about 2½ : 1, and together with Table 3, in which the ratio is again 2½ : 1, this demonstrates that animals and wind are of about equal importance in distributing the more successful species into new areas.

TABLE 3. Plants which have extended into five or more new areas and their dispersal agents.

Wind dispersal	No. of new areas (net)	Animal dispersal	No. of new areas (net)
Sycamore	9	Field rose	12
Common maple	6	Dog rose	7
Downy birch	6	Mountain ash	7
Hornbeam	7	Red currant	6
		Sweet chestnut	6
		Five species (Table 1)	5

By study of the maps, consideration of the furthest distance from a parent plant at which its offspring is likely to be found after eighteen years, suggests that the modal (=most frequently occurring) distance for trees and shrubs dispersed in these ways would seem to lie between 300 metres and 500 metres. This leap could, of course, be made in one year, e.g. by means of a jay carrying an acorn from the wood to the Plains and burying it, as has been observed, then not retrieving it, but broadly speaking the offspring must reach maturity and produce seed before further leaps take place, and for trees this may take at least several years. Of course, there are some wide variations from the mode, for some species (e.g. downy birch) may have reached distances three or four times as great from their origins.

Notes on individual species are given below. An asterisk (*) denotes that the species is illustrated in Fig. 1.

SCOTS PINE is very rare; the soil is not suited to the spread of this tree.

YEW. The gain of five areas is greater than the average, but its distribution consists of scattered trees, and it does not form large stands in the woodlands.

*SYCAMORE is spreading rapidly, and in places may be hindering the regeneration of oak-wood (R.S.).

*NORWAY MAPLE is another successful species of *Acer*, having spread from one tree in area D into two adjacent areas. The tree in area S was planted, but it has also been recorded from the adjacent area R.

*COMMON MAPLE. Another *Acer* to have shown a greater than average spread on the Common. It is more widely distributed than the Norway maple, and has as wide a range as the sycamore but is not as abundant.

*HORSE CHESTNUT, RASPBERRY, *DOWNY BIRCH, *MOUNTAIN ASH, *HORNBEAM and SWEET CHESTNUT have at least doubled the number of areas in which they are found, with increases of from five to seven. The trees are not, however, equal in their performance for whereas saplings of horse chestnut and downy birch are plentiful, those of hornbeam and sweet chestnut are scarce (R.S.).

HOLLY is common in the woods and in some places is the dominant shrub. It has three methods of reproduction: by layering, by suckering, and from seed. The first method was observed at Bookham where, in the denser parts of the woodland, there is a tendency for the branches to elongate and droop, forming roots on reaching the soil. This method is mentioned in Peterken & Lloyd (1967). Suckers and seedlings are common.

*SPINDLE and *TURKEY OAK appear to have substantially extended their distribution by five areas, but the spindle is rare and less abundant than Turkey oak where it occurs. The latter species was probably missed in 1953 from some areas in which it has recently been recorded, and saplings are few (R.S.).

The leguminous shrubs are not doing well. *GORSE has increased its range by only one new area and is thought to be less abundant now. BROOM, a casual, remains in two sections. *DWARF GORSE and *PETTY WHIN have seriously declined. These, preferring open habitats, might be expected to disappear as woodland invades their habitats, but it is largely bracken *Pteridium aquilinum* which has overrun them.

*FIELD ROSE has apparently invaded more than twice as many new areas as the *DOG ROSE, though there was not much difference in the number of areas occupied by each in 1953.

Of the *Prunus* species, BLACKTHORN is now found in nineteen divisions. WILD PLUM and WILD CHERRY are too few in number to be important members of the woodland community except to add to its variety and beauty in the spring. An unrecorded species, CHERRY PLUM, has been found by Miss M. E. Robins.

The species of *Ribes* are interesting: GOOSEBERRY seems to have died out completely though present in three divisions in 1953. *BLACKCURRANT, present formerly in seven sections, is now found only in four, and is one of the few species whose range has contracted, whereas *RED CURRANT, formerly in nine divisions, is now found in fifteen.

The *ENGLISH ELM is found, as formerly, only on the boundary in all the western areas. The elm has a light wind-dispersed seed, and the prevailing winds would carry these on to the Common, but seedlings are rarely found in Britain as few seeds germinate (R.S.), and the chief method of propagation is by suckers. It is significant that this is the only tree whose range has contracted; its reliance on vegetative propagation coupled with its unfavourable position for reaching other areas by this means is no doubt responsible. Tansley (1939) remarks that it does not enter into semi-natural vegetation at all. The main constituent of Station Copse is elm, arising from suckers from a line of old planted trees (Jones 1959).

*BEECH has made an average spread into four more areas but it is not successfully competing with oak in the woods. Tansley (1939) states that on heavier soils oak has an advantage over beech, and this is true at Bookham where oak is the dominant tree.

As far as is known, there is only one ALDER tree on the Common. This was planted in area S four years after the first survey.

ALDER BUCKTHORN and *GUELDER ROSE are a little puzzling as they seem to be absent from all their former sections and are found in new ones. Both these shrubs are scarce or overlooked.

*BUTCHER'S BROOM, as can be seen from the map, is found in all the woodland sections and is one of the species which has been carried across intervening grassland and scrub into the new western copse of area Q. A special study is being made of this plant.

The WILLOWS, of which there are several varieties on the Common, have presented too much of a problem to the less expert members of the survey team; as the recording is incomplete they have been neglected in this account, but would merit further study in view of their importance for insects. A species new to the Common, the eared willow, *Salix aurita*, was found by R. Stern in 1971.

I am grateful to all those recorders who have made this account possible, namely, those mentioned in the first paragraph, and the team who made the original census: A. W. Jones, E. B. Bangerter, the late C. P. Castell, Mrs J. F. Hall and P. C. Hall. I thank R. Stern for comments on this paper.

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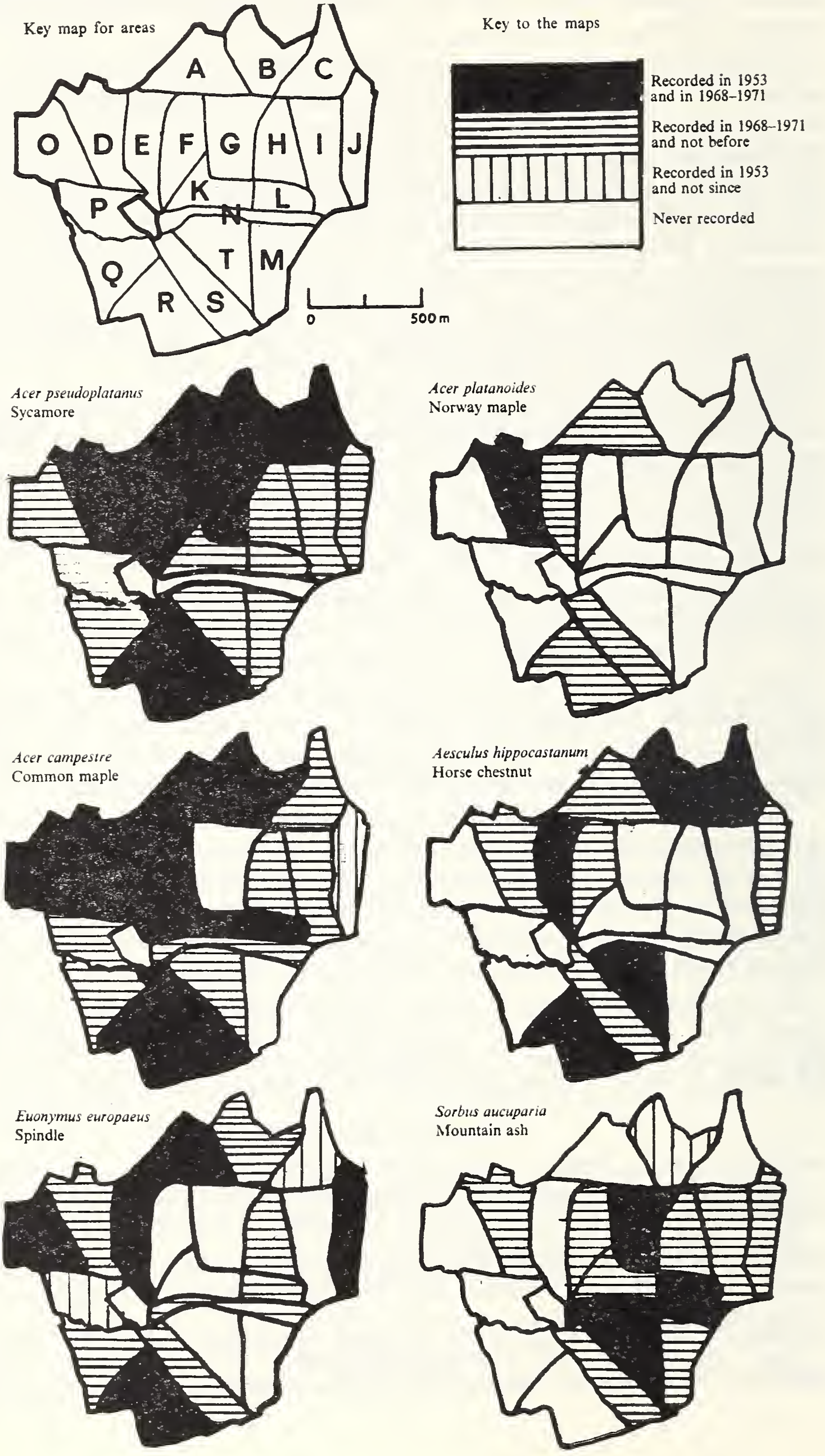
FIG. 1. Changes in the distribution of trees and shrubs on Bookham Common, 1953-1971.


Key map for areas
A
B
C
O
D
E
F
G
H
I
J
K
L
P
N
T
M
Q
R
S
0
500 m
Key to the maps
Recorded in 1953 and in 1968–1971
Recorded in 1968–1971 and not before
Recorded in 1953 and not since
Never recorded

Acer pseudoplatanus Sycamore

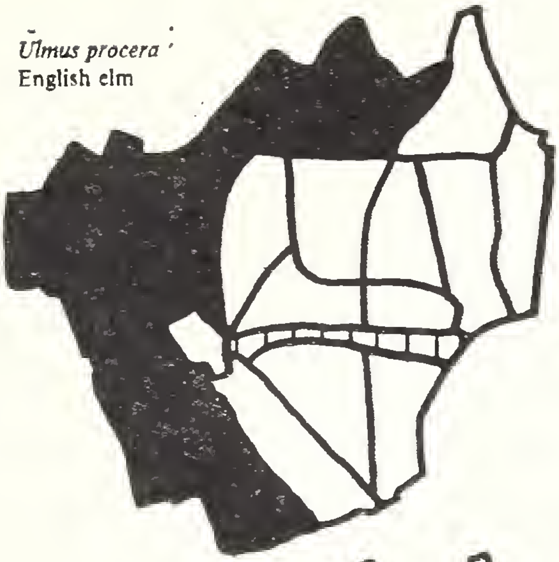
Acer platanoides Norway maple

Acer campestre Common maple

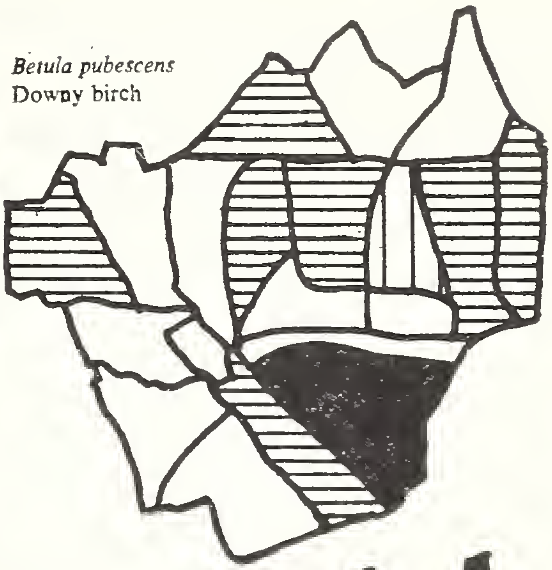
Aesculus hippocastanum Horse chestnut

Euonymus europaeus Spindle

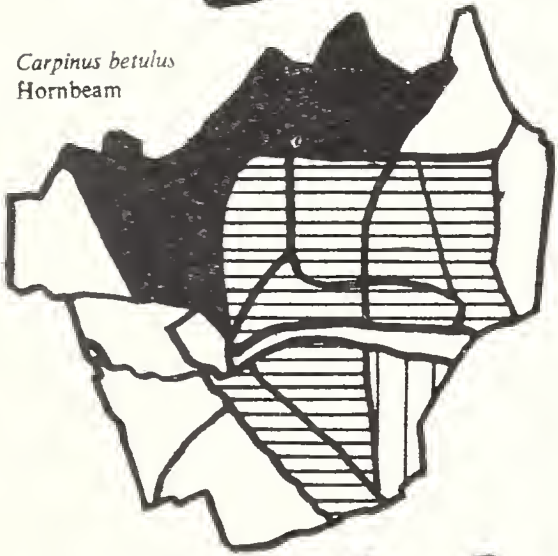
Sorbus aucuparia Mountain ash



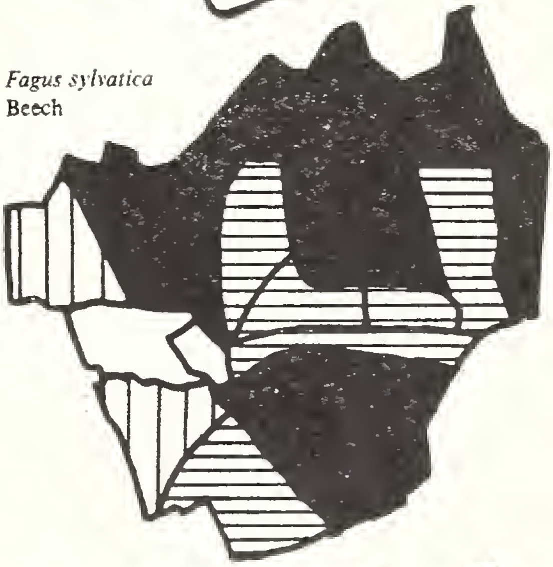
Ulmus procera
English elm



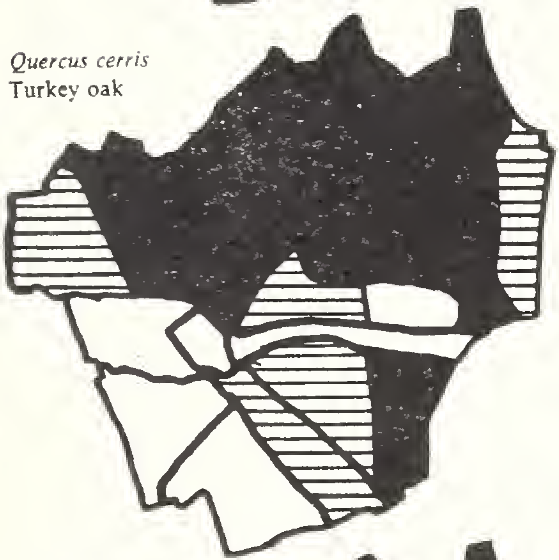
Betula pubescens
Downy birch



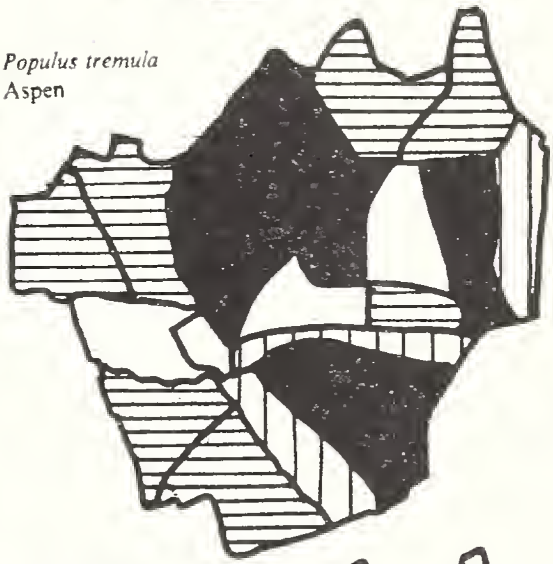
Carpinus betulus
Hornbeam



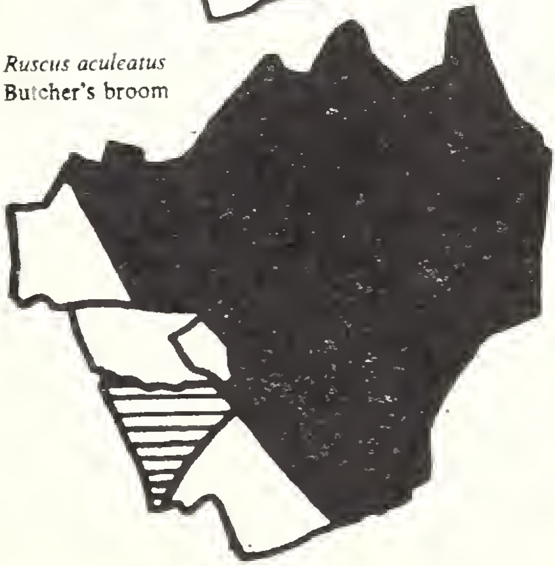
Fagus sylvatica
Beech



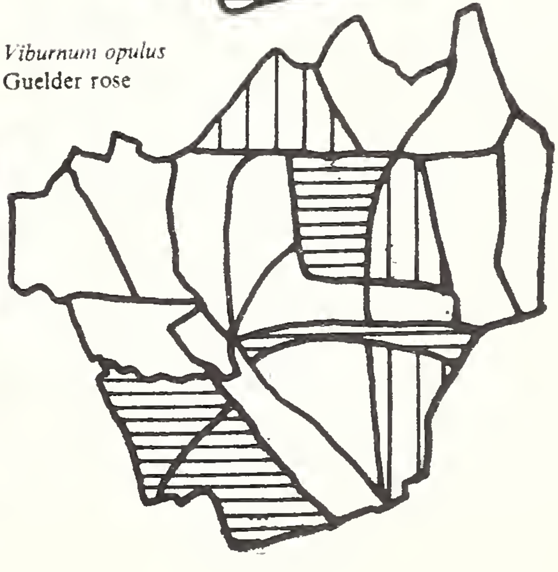
Quercus cerris
Turkey oak



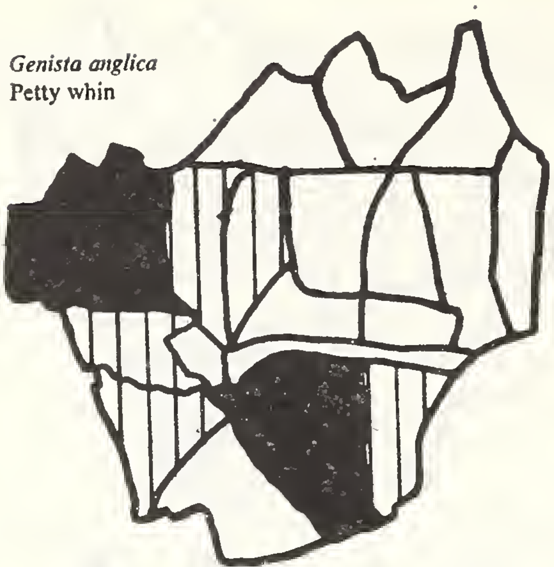
Populus tremula
Aspen



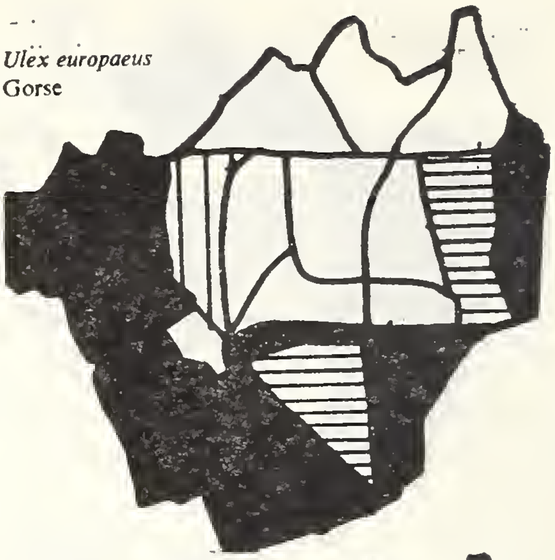
Ruscus aculeatus
Butcher's broom



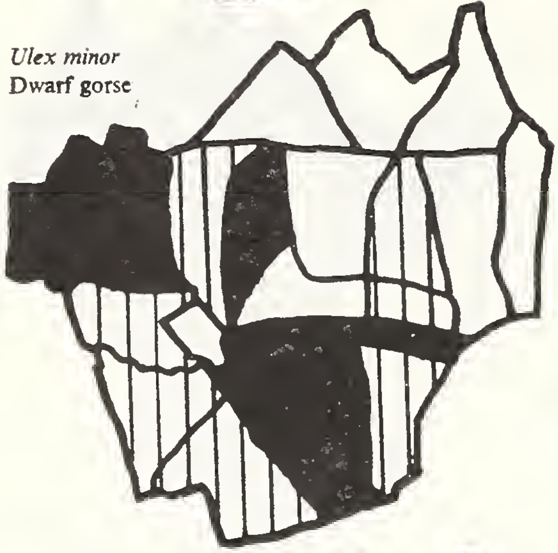
Viburnum opulus
Guelder rose



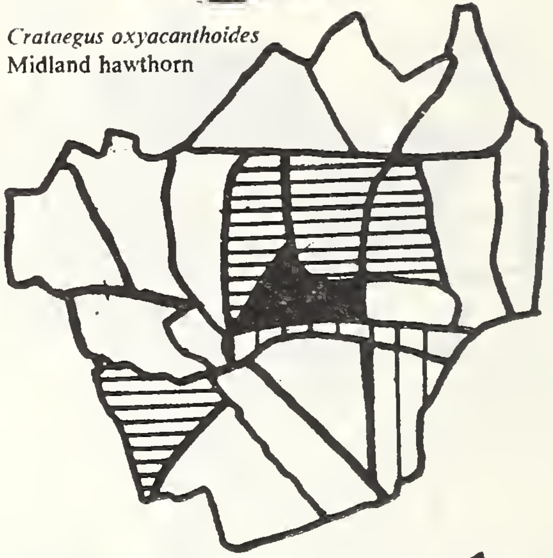
Genista anglica
Petty whin



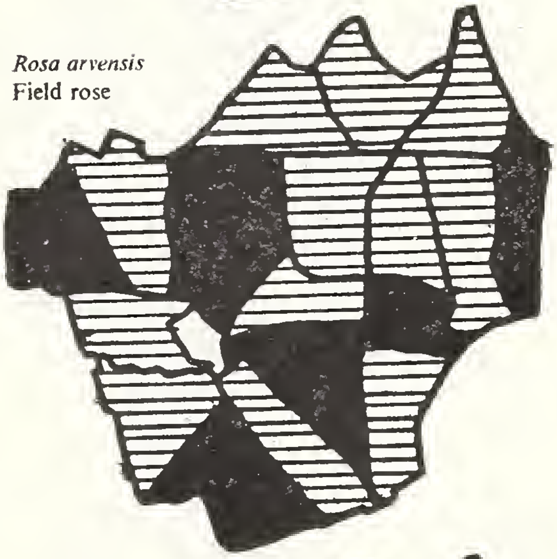
Ulex europaeus
Gorse



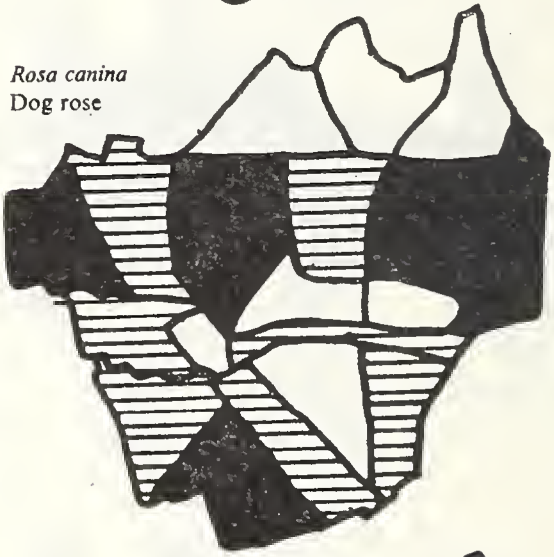
Ulex minor
Dwarf gorse



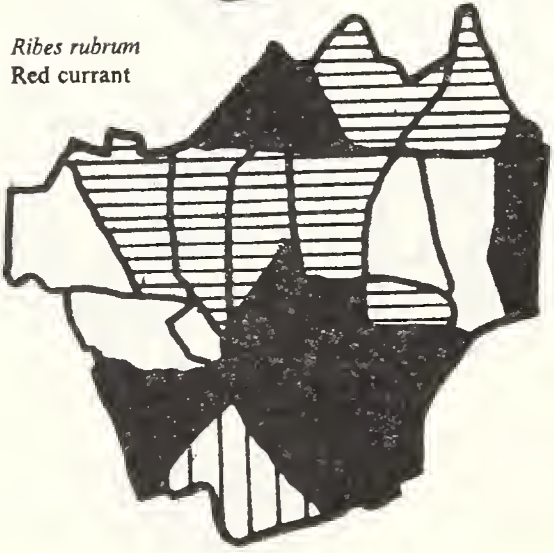
Crataegus oxyacanthoides
Midland hawthorn



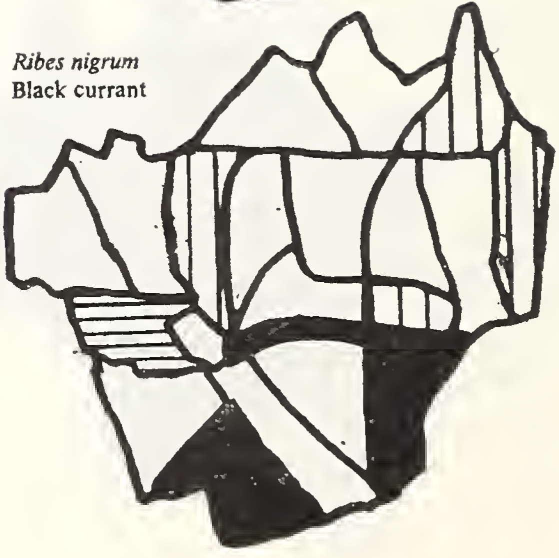
Rosa arvensis
Field rose



Rosa canina
Dog rose



Ribes rubrum
Red currant



Ribes nigrum
Black currant

A Rabbit Survey of the Bookham Commons

by M. Towns

Summary

The rabbit, formerly more widespread on the Bookham Commons, is now mainly associated with the soft grasslands maintained through the intervention of man. Their populations appear to be highly dependant on the pastures grazed by domestic animals. With the gradual withdrawal of these animals from the Common, there followed many changes in the character of the Plains rendering them unsuitable for intensive occupation by rabbits. It is noteworthy that even at their peak the rabbits were on the whole unable to prevent this development and it is possible that the present pattern of distribution may have been evolving even before myxomatosis produced its profound effects.

Examination of the wetter regions revealed little evidence of extensive surface-living and at two sites where feeding grounds were available numerous burrows had been excavated. These burrows were on land marginally higher than that of the surroundings, a height sufficient to prevent flooding in the burrows and so obviate any necessity for the pursuance of a surface-living existence.

The regular shoots carried out by the Box Hill and Headley Rabbit Clearance Society has resulted in the rabbit communities being maintained in individual sub-groupings of burrows rather than massive interconnected warren systems. The shoots have also been concentrated at the locations of Warrens B and C and the Bank's community of Warren E, creating a population vacuum in these areas. It seems likely that rabbits from the thriving Warren E, along the railway line, are continually moving into these areas.

Introduction

A survey of the rabbit, *Oryctolagus cuniculus* (Linn.), population of the Bookham Commons was conducted over a period of two years 1969-1970. The objects of the investigation were:

1. To plot the location of the rabbit burrows in order to:
    (a) examine their structure;
    (b) investigate their association with the feeding grounds;
    (c) investigate their association with the environment.
2. To undertake an assessment of the habit of "surface-living". This habit was thought to be due to the high water-table of the Common, which because of the ever-present danger of flooding makes the excavation of burrows impractical. Such a situation might lead to the rabbit population pursuing a surface existence similar to that of the hare, *Lepus capensis* Linn.

One of the first results of the survey was the discovery that, although rabbits are present on all parts of the Common, the major part of their population is confined to several small areas of favourable habitat. These areas have been delineated on the accompanying map (Fig. 1). All boundaries are approximate and are based on signs of obvious rabbit activity and by the location of the collections of rabbit pellets which serve to mark individual and group territories (Mykytowycz 1968). Such collections are easily distinguished from other randomly deposited faeces. At Bookham the mounds of the

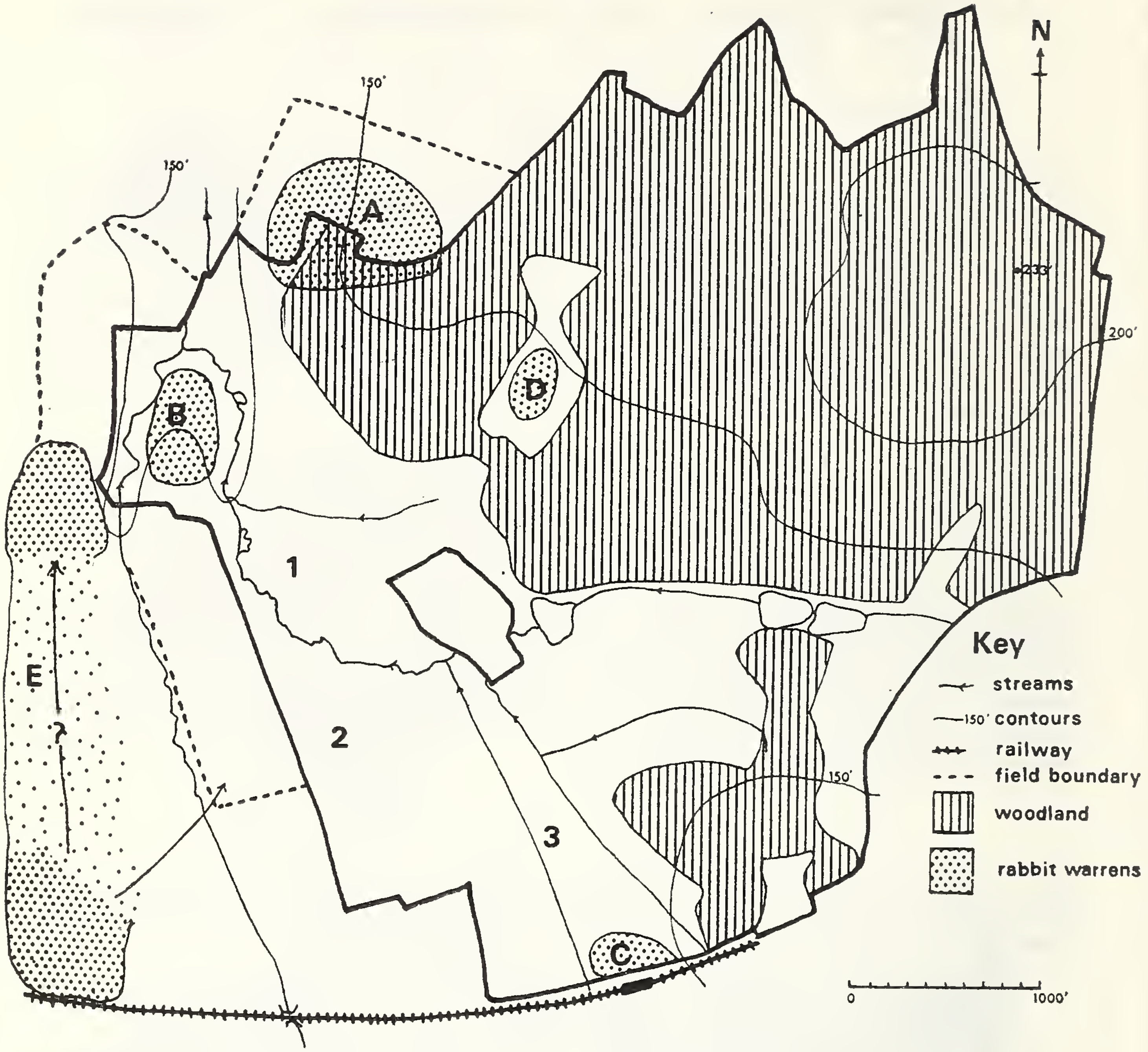


FIG. 1. The rabbit warrens of Bookham Commons.

yellow meadow ant, *Lasius flavus*, and patches of burnt or bare ground are often utilised for the deposition of pellets.

Each warren is considered separately and comparisons and dissimilarities described where appropriate. The question of surface- and burrow-living is discussed for each habitat, and the results of the investigations on burrow structure, habits and colonisation follows the description of the warrens.

The Warrens

Warren A

Warren A is the largest of the rabbit colonies on the Common. Its main burrow system is located at the edge of Hill House Wood at approximately the 130 ft contour level. Seven other smaller burrows are ranged up the slope of the hill as far as the 175 ft contour. Owing to the relative steepness of this slope, the burrows ramify deeply underground. Since a policy of digging out burrow systems was avoided during these investigations, much of the information on these burrows has been obtained by detailed observation from the outside.

The main burrow system was made up of three subgroups with (at the time of writing) eight, ten and ten entrances respectively. It could not be fully ascertained whether these groupings were interconnected, but their close association suggested this. It seemed possible, therefore, that each one of the subgroups was once an individual colony and that these colonies had merged as their populations and excavations had expanded. The other burrows had five to eight extrances and this gave extra weight to the hypothesis that the larger system was originally three smaller separate systems. A similar process of haphazard expansion of an existing warren was described by Thompson and Worden (1956).

All of the burrows were located very close to the Common boundary, allowing ready access to two large permanent pastures which abut the Common at this point. These pastures are the feeding grounds for the rabbits of this Warren. Little foraging takes place in the surrounding woodland, except in the immediate vicinity of the burrows, and this lack of utilisation of the woodland is a notable feature of the Common.

Warren B

Warren B is situated partly on Bank's Plain and partly on Western Plain. Jones (1954) classified Bank's Plain as an open area without a dominant species and Western Plain was shown to be dominated by *Deschampsia caespitosa*. In the northern areas of each Plain were scattered clumps of hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*) scrub. This scrub has spread spectacularly since then, particularly between Bank's Stream and Bookham Stream, and has interspersed within it a number of small open spaces. These open spaces are heavily grazed and are maintained in their present form solely by the activities of the rabbits of Warren B.

The Warren lies at approximately the 100 ft contour level and has been excavated predominantly in the London Clay lying between the belts of alluvium which flank the courses of Bank's and Bookham streams. Much of the London Clay is slightly, but significantly, elevated above the surrounding alluvium.

The structure of the burrows here is very different from those of Warren A. They are usually small, their entrance tunnels only rarely exceeding five in number, forming individual colonies, most of them encircling the bases of hawthorn shrubs. Other burrows of simple structure were found which were merely open-ended passages, usually passing beneath a tree root or, occasionally, below a mound of the yellow meadow ant. Burrows of this type would appear to be nest-stops in the process of enlargement.

Three-quarters of the burrows of Warren B were sited on the perimeter of the grassland clearings, the remaining quarter being positioned deeper in the scrub but still maintaining unhindered access to the local feeding ground.

As was mentioned earlier, the area of London Clay within Warren B was slightly elevated above the flanking alluvium. This increase in height is sufficient to place the bulk of the London Clay above the normal winter water-table and it is here that virtually all of the burrows are located. Only a few nest-stops were seen on the alluvial belts and these became flooded when the water-level rose near the surface. Such flooding of burrows was never encountered on the London Clay during the course of the survey.

Warren C

Warren C presents a habitat similar in many ways to Warren B, but on a reduced scale. The burrows of this Warren are also grouped around the perimeter of a closely-cropped grass clearing and, again, are excavated at the base of some hawthorn bushes. The area as a whole lies in the belt of alluvium where it enters the Common by Bookham railway station. At this point it lies at approximately 140 ft, a height which again appeared adequate to prevent the flooding of burrows from the normal fluctuations of the water-table.

In Beven (1966, 1968) it was suggested that the lower-lying wetter areas of Bank's, Central and Western Plains could only support populations of rabbits which led an existence predominantly or entirely on the surface, a change in behaviour which was presumed to have been brought about by the presence of a high water-table in these Plains. If the rabbit population was uniformly distributed across the Commons, such a suggestion would receive some support. However, the map (Fig. 1) shows that the rabbit population of the Commons at the present time is far from uniformly distributed. Investigations carried out in and around the low-lying areas, which are chiefly the alluvial regions, revealed little evidence of a continued occupation or even presence of rabbits. On other parts of the Common which supported a rabbit community, some grazing invariably takes place on the mown grass of the paths within the warren territory. Evidence for this is provided by the collections of pellets and the presence of "scrapes", small holes about 2 cm deep produced by the rabbits, possibly for feeding or as a displacement activity. Also frequently seen in the winter months were hawthorn bushes from the bases of which bark had been stripped. These features were extremely uncommon or non-existent in the low-lying belt, except for the areas adjoining Warrens B and C.

Significantly the burrows at both Warrens B and C have been excavated on ground which rises above the general level of the surrounding land. At both Warrens the wetter areas are avoided as places for continuous occupation and are utilised primarily as feeding grounds. The central region of the alluvial belt, where it passes through Central and Isle of Wight Plains, is flat and without any measurable difference in height and at present supports very few rabbits.

All this points to the rabbit populations as being fully able to exploit the inconsistencies of their environment to full advantage, thus obviating any need to pursue a surface-living existence in the less favourable habitats presented by the low-lying plains.

We must now consider the individuals which are pursuing a surface existence and review the results of the investigations at Warren D. Individual animals are present in small numbers across all parts of the Commons, although notably less frequently in the interiors of Bayfield and Isle of Wight Plains and in the interiors of Central and Eastern Woods. Thompson and Worden (1956) found that, on the whole, the bucks were more likely to take to surface-living, and that towards the end of the breeding season there was generally an increase in the numbers of surface-living individuals. This increase was presumably precipitated by the break-up of breeding hierarchies and by the numbers of young animals which had yet to settle into a burrow system. Although it was not possible to carry out operations to verify if this was also applicable to Bookham Commons, it seems reasonable to assume it.

Warren D

Warren D is the only Warren on the Common which is almost certainly surface-living. Its rabbits are centred on an area of almost impenetrable bramble (*Rubus* spp.) and sapling birch (*Betula verrucosa*). Several attempts to penetrate this thicket met with varying degrees of success and did reveal evidence of the presence of rabbits, although a burrow has yet to be located. It is a small community and probably a vestigial one, with the dense bramble affording protection for its members. In all likelihood a larger community had previously existed on what was once the large open tract between Hill House Wood and Central Wood, which has now become greatly overgrown and less attractive to the animals.

Warren E

Finally, there are the colonies of Bank's Common (Warren E). Although this Common is not usually considered by the Bookham Common Survey, it is nevertheless important in the context of this survey. There are two main foci for the rabbits; one in the region of Bank's Farm, and the other in the lower region of Bank's Stream and the railway embankment.

The Bank's Farm colony is established on the southern boundary of the farm. Burrow structure here is similar to that found at Warrens B and C, although the individual burrow systems tend to be rather more complex. One of these burrow systems has assumed a form comparable to the burrows of Warren A and has been excavated below and around a large heap of dead wood, with entrance holes passing well below the surface. Feeding grounds for this colony are provided by the meadows of Bank's Farm and, in part, by the extensive pastures below Bank's Cottage and Five Halls.

The second Bank's community is largely centred on an extensive area which borders the railway line west of the Common and is heavily grazed by the rabbits. As far as can be ascertained this Warren does not suffer from interference by man and in consequence supports a considerable number of rabbits. The railway embankment is the site of numerous nest-stops, and sub-communities can frequently be found along the lower reaches of Bank's Stream. This site is of considerable interest. It may be from this centre that a degree of "restocking" of the Common takes place. There is ready access to the Five Halls pastures and several burrows are located here and along the river close by the burrows of Bank's Farm.

The burrows of Warren E are of a comparatively uniform size, their entrance holes rarely exceeding ten in number, usually with an average of six or eight, forming the typical sub-communities seen in the other warrens. Some of the burrows are excavated at the bases of shrubs and some in the open woodland, with seemingly no preference of habitat.

Population Changes

In previous years, the rabbit benefited from the large-scale grazing of domestic animals which maintained extensive regions of the Common as soft grassland. With the withdrawal of these animals there was a gradual increase of scrub, bracken and tufted hair grass on the open areas. Except in a few favoured districts, it appeared that the rabbits were unable to check this widespread increase of vegetation (Beven 1968) and as the species concerned appear unpalatable to rabbits, they may even have assisted in their spread. Eventually it had become apparent that many of their former feeding grounds had become unavailable to them. Finally, the outbreak of myxomatosis and the regular control measures instituted since then by the Ministry of Agriculture, Fisheries and Food has meant a continued reduction in their numbers on the Bookham Commons, generally rendering them too few and too subject to population fluctuations to produce any substantial effect on the vegetation. The result has been a concentration of present populations on the available meadow land within and predominately outside the Common.

Bank's Plain still contains enough soft grassland to support Warren B, and the meadows of Bank's Farm, Five Halls and Hill House provide for the large expanding Warrens A and E. Warrens

C and D are probably the remnants of the original warrens of the grazed plains, and they are now themselves in a state of degeneration.

Another interesting development, possibly brought about by the reduction in numbers of the rabbits, can be seen in the construction of the burrows. They have tended to remain small, forming individual sub-communities. At the bases of shrubs, as in Warrens B and C, the entrance holes to a sub-community rarely exceed five in number, and for those of the open woodland and woodland edges the entrance holes may number from five to ten. This suggests that there may be an optimum number of members to a social grouping and that the sub-community is the basic units of a community. Only once were these sub-groupings found to be inter-connected (at Warren A) and this seemed to be more as a result of competition for space in a favourable habitat, than for any other reason.

It is worth considering whether the present situation differs substantially from that before the onset of myxomatosis. There is an unfortunate lack of information about the rabbits on Bookham Common but it is assumed that the animal was more abundant than at present and that larger, more complex warrens were usual. It has been shown that these warrens (which often reached a considerable size) were enlarged haphazardly, often when a developing nest-stop at its periphery connected with its tunnels. At Warren A three sub-communities became joined in much the same manner, showing that the capacity for similar expansion is still present. Given an increasing population other instances would, in all likelihood, be recorded. However, numbers were greatly reduced by myxomatosis and have remained at a low-level through the twin agencies of control and the occasional epizootics of myxomatosis, outbreaks of which were known to have occurred in 1958, 1966 and 1969.

The rabbits appeared to recover rapidly from the 1966 and 1969 epidemics of myxomatosis and the disease does not seem to be as potent a factor as it has been in the past, but there can be no doubt about the effectiveness of the manner in which the Box Hill and Headley Pest Control Officers carry out their tasks. After a shoot in February 1969, it was found that a greater part of the Bank's community of Warren E had been exterminated, a small community in South-East Wood had been destroyed by gassing and a number of sub-communities in Warrens A and B subsequently fell into disuse. The total number of rabbits taken on this shoot was 89. Another less thorough shoot was carried out in the autumn of 1969 and shortly afterwards three well-established sub-communities at Warren B were found unoccupied and Warren C appeared to have been seriously disturbed. Since then the species has recovered rather well and the numerous earthworkings and activity indicates that numbers are almost back to the level noted before February 1969. Only Warren C has failed to show any further signs of increase in activity.

This greater likelihood of the death of some or all of the members of a sub-community with the subsequent decay and possibly destruction of the burrow system, has acted to prevent expansion into larger burrows, and has maintained a sub-community structure. The siting of the burrows is as follows:

Open grass	Grassland scrub edge	Deep scrub	Grassland wood edge	Deep wood
1	21	3	16	2

The figures given are for the numbers of burrows with four or more entrances, and are the total number recorded as occupied in December 1970. All of the burrows are sited at the edge of a feeding ground and, where both scrub and woodland are available at a site, neither habitat is colonised in favour of the other.

Finally something must be said about the future of the rabbit on Bookham Commons. A great deal of clearance is being undertaken by the Conservation Corps: they have been removing scrub from the areas it has recently invaded, and cutting back the pure stands of bracken (*Pteridium aquilinum*) and the extensive areas of tufted hair grass on Bayfield and Central Plains. Much of this activity has resulted in an increase in the softer grasses which are attractive to rabbits. So far utilisation of this new source has been slow, and it still remains to be seen whether or not these grasses will serve as foci for rabbit colonisation. In fact this increase of feeding grounds may favour an increase in numbers, and a more widespread population will certainly present a more difficult task for the Pest Control Officers. Recent spread has been mainly at or near the sites where the rabbit is already abundant, as at Bank's Plain, Kelsey's Wood and in South-East Wood, or at districts where pasture is already available, as at Hazel Copse.

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Gall Midges of the Pedunculate Oak

by Armand E. Le Gros

Barnes (1951a) remarked on "the appalling lack of knowledge concerning the biology and bionomics of oak gall midges" and the section on this subject is perhaps the least satisfactory in his important work. Some work has been done partly at Bookham and partly in the north-west of Kent to elucidate life histories of the midges of the pedunculate oak (*Quercus robur* L.) and this preliminary paper endeavours to summarise what is known at present of these flies in Great Britain. Most of the insects found on *Q. robur* are also found on the durmast oak (*Q. petraea* (Mattuschka) Liebl). On the Continent a number of midges have been recorded as galling the Turkey oak (*Q. cerris* L.) but in the London Area I have found that few insects attack this tree. It would seem that when it was introduced here few of its associated insects were brought with it.

In the following key to the recorded galls I have tried in some cases to attribute them to the correct midge species but as Barnes has pointed out many of the named midges are known only by a description of the gall or the gall and the larvae, and the adult insects have not been described. Some of the midges discussed here are not to be found in our national collections. Species starred (*) have been found at Bookham and most of them are new records for the Common. The B numbers refer to Hermann Buhr's great compilation on European galls.

1. Acorn aborted and/or acorn cup distorted. Gregarious reddish larvae. Not recorded in Buhr.
   **Dasineura* sp.
   Galls of the buds and shoots 2
   Galls of the leaves 3

2. Terminal internode shortened, leaves crinkled and loosely bunched in a tuft. Leaf nerves thickened and hairy. Yellow-white gregarious leaping larvae. B5403.
   **Contarinia quercina* (Rubsaamen)
   Leaf bud closed. Reddish larvae. B5406.
   Janetia quercicola (Kieffer)

3. Irregular swellings along main and secondary veins. B5512A.
   Dasineura panteli (Kieffer)
   Swellings on the leaves 4
   Rolling or folding of the leaf margin 5

4. Swelling above the leaf, circular depression below, 5 mm diameter. Larvae free. B5516.
   **Dasineura libera* (Kieffer)
   Slight swelling on the blade of the leaf. B5486.
   Dasineura malpighi (Kieffer)

Circular gall 3 mm diameter, on underside of leaf. White larva (Burkill 1930).
Cecidomyiidae spp.

5. Lobe of leaf thickened and folded downwards, green sometimes with yellow or red patches. Single white larva. B5507.
**Macrodiplosis dryobia* (F. Low)

Narrow part of the leaf margin between two lobes discoloured, rolled upwards. One or more pale to yellow larvae. B5506.
**Macrodiplosis volvens* Kieffer

Reddish or salmon coloured gregarious larvae have been reported from deformed acorns and acorn cups by Cameron (1891) and Bagnall & Harrison (1917). I have found galled acorn cups with several reddish larvae on occasions at Bookham. Bagnall & Harrison (1922) also recorded white solitary larvae in acorn cups and attributed them to *Dasineura* (*Perrisia*) *squamosa* Tavares. Barnes (1955) having reared midges from distorted acorns and acorn cups suggested that four species are likely to be found in this habitat. Firstly a *Dasineura* sp. which attacks the acorn when it is soft and immature; then a *Contarinia* sp. which arrives later when the acorn is hard but can live in the space between the acorn and the acorn cup; and finally a pair of probably polyphagous species: an inquiline *Clinodiplosis* sp. and a predatory *Lestodiplosis* sp. Unfortunately Barnes did not live to establish specific names for these four.

Several species have been recorded as attacking buds and shoots. I have only occasionally met with galls of *Contarinia quercina* which Buhr says has two generations a year. *Dasineura dryobia* Rubs. is said to be an inquiline in these galls. I have never met with the galls of *Arnoldiola quercina* (Binnie), B5404, which deform shoots, or *Arnoldiola quercicola* (Kieffer), the adults of which have not been described.

The only oak midges Niblett recorded from Bookham have been the two *Macrodiplosis* species. He found the solitary white larva of *M. dryobia* in the gall in May and June, after which it dropped to the soil for pupation, the adults emerging in the following May. There is only one generation a year. He reared also *M. volvens* finding only one generation a year, the galls being found in June-July and the adults appearing in the following May and June. There is, however, evidence from continental workers (Skuhrava & Skuhravy 1963) that under favourable conditions a second generation of galls could appear in August-September. The galls of both species usually contain one or more larvae of an inquiline **Monodiplosis liebeli* (Kieffer). I have found the galls rather uncommon at Bookham of recent years.

I have occasionally come across, in June and July, small depressions on the underside of a leaf occupied by a small free-living white larva. On the other side of the leaf are barely perceptible swellings.

Buhr suggests this gall to be that of *Dasineura libera* (Kieffer), which Bagnall & Harrison (1918) recorded from Lancashire. D. v. Leeuwen (1957, No. 821) says that when the larva leaves to pupate in the soil the site of its feeding dries up and breaks away, leaving a small hole.

Burkill (1930) recorded a circular gall about 3mm diameter on the underside of the leaf containing a white larva. The gall resembled that of the sexual form *vesicator* of the cynipid *Neuroterus numismalis* Fourcr. but lacked radial striae. He found the galls in Kent, Shropshire and Surrey, but was unable to suggest the causer. He said that the larva eats its way out of the gall to pupate in the soil.

Kidd & Brindle (1959) recorded the galls of *Dasineura malpighi* from Lancashire and Cheshire as circular pustules 2-3mm across, raised only slightly above the surface of the leaf.

Midges have been reported at different times as inquilines living in the leaf rolls made by beetles but I have never met with these. As Aphids are sometimes common on the undersides of leaves I have been surprised that the aphidivorous cecid larvae have not been reported from oak by Nijveldt (1957) or by Wood-Baker (1965).

In previous notes (Le Gros 1963, 1971) I have referred to the reddish gall midge larvae associated with the oak apple galls of *Biorhiza pallida* (Olivier). These larvae may be found sparsely from June on the outside of the gall near the point of attachment. Later they enter the gall through the exit holes of the gall's inhabitants and in the winter months may be quite common. Most larvae belong to **Clinodiplosis biorhizae* Kieffer, which feed on the gall tissue, and pupate mainly in the gall but occasionally in the soil. I have managed to rear specimens in different months from August to May. The midge is probably polyphagous and associated with other woody galls on oak (see below), and there is probably more than one generation a year. The other larvae belong to a predator of the larvae of *C. biorhizae* which Mr W. Nijveldt of the Institute of Phytopathological Research, Wageningen, Netherlands, informed me was an undescribed **Lestodiplosis* sp.

One frequently finds similar reddish larvae in the scales of the outer gall of the cynipid *Andricus fecundator* (Hartig) from August onwards. Bagnall & Harrison (1921) attributed them to *Arnoldia gemmae* Rubsaamen. Niblett (1952) reared some also and attributed them to *Clinodiplosis gallicola* Rubsaamen, finding that they pupated both in the gall and in the soil, and that the adults emerged in August-September of the first year or lay over until April in the second year. I have reared a *Clinodiplosis* sp. and a *Lestodiplosis* sp. from decaying galls of *A. fecundator* which I was unable to distinguish from the pair reared from oak apple galls. Blair (1940) records rearing cecids from decaying damaged *Andricus kollari* galls, and I have also found *Clinodiplosis* larvae in bird-pecked marble galls and also in *A. inflator* galls. It seems likely that all these woody galls are the various habitats of a single species of *Clinodiplosis* and its predator. The presence of these inquilines does not affect the gall causer as they only begin to flourish after it has left the gall.

The spangle galls of *Neuroterus quercusbaccarum* (L.) agamic form *lenticularis* (Olivier) are usually abundant most years on oak leaves in the autumn. From August onwards many of the galls are attacked by larvae which live between the gall and the underside of the leaf. They are attributed to **Parallelodiplosis galliperda* (F. Low) by D. v. Leeuwen (No. 836) and Buhr (p. 957) who call the larvae red, but I have found them mainly deep yellow to orange red, densely papillate, with the terminal segment of a typical *Clinodiplosis* pattern. *P. galliperda* was first recorded as British by Bagnall & Harrison (1916) from Yorkshire but their comment that the galls are slightly swollen, pale and irregular with whitish wriggling larvae leads me to think that they had another species before them.

In 1969 I examined over 2,000 galls taken from several localities in Kent and Surrey and found 300 *Parallelodiplosis galliperda* larvae on them, the percentage of infestation varying from 2·5 at Bookham to 44 at Chislehurst, Kent. Usually there was only one larva to a gall, rarely two or three. On three occasions I found a larva with an ectoparasitic chalcid larva. Attempts to rear the cecid and chalcid larvae failed due to mould and in 1970 and 1971 galls were scarce. Both D. v. Leeuwen and Buhr note that the larva deforms the gall. The feeding of *P. galliperda* is in fact disastrous to the gall's inhabitants (gallcauser, inquiline or parasite). It feeds deeply into the underside of the gall working in a circle round the central point of attachment, causing the gall to darken, dry and shrivel, compressing the central cell and crushing the occupant. I opened forty of the distorted galls and failed to find a live insect. The unattacked galls break away from the leaf in late September-October and remain light in colour with yellow-green undersides right through the winter. Attacked shrivelled galls are to be found still attached to the leaf in late December.

Another discoid gall, that of *Neuroterus albipes* sexual form *laeviusculus* Schenck, is also attacked by a larva attributed to **Xenodiplosis laeviusculi* Rubsaamen by Bagnall & Harrison (1917). Niblett (1940) has reared the larvae, finding that the fly emerged in July of the second year. The gall is not common at Bookham being found in ones or twos as compared with the hundreds of the form *lenticularis*. I have found the larvae, which have the look of a *Clinodiplosis* but I did not rear them. Buhr (p. 956) says that the larva causes deformation of the gall.

Barnes (1951b) discusses eight species of midges reported by J. Kieffer attracted to the cut surface of stumps of freshly felled trees, where the larvae feed on the sap. Mr R. W. J. Uffen tells me that he saw cecidomyiids collecting on a freshly cut stump at Bookham in early autumn 1971. Very little is known about these midges or about the larvae of **Mycodiplosis* spp. which may be found on moulds which sometimes attack oak leaves. The same may be said about the larvae to be found under damp bark. Usually the larvae belong to the subfamily Porricondylinae, and are sometimes quite numerous.

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The Arachnida of Bookham Common

by Armand E. Le Gros

A Revised List of Spiders

In a previous list (Le Gros 1951) 100 species exclusive of linyphiids were recorded. I was not able to visit the Common regularly between 1954-1967 but I was able then to prepare a working list of 171 species including linyphiids. When I began to revise this list, I received from D. Macer-Wright a list of eighty-seven species collected between 1951-1953. He was the first to collect *Dysdera erythrina*, *D. crocota*, *Clubiona lutescens*, *Xysticus kochi*, *Pardosa prativaga*, *P. hortensis*, *P. proxima*, *Xerolycosa nemoralis*, *Trochosa robusta* (believed to be a county record), *Pirata latitans*, *Steatoda phalerata*, *Singa sanguinea* and *Cercidia prominens*. Nellist (1969) records a visit of the British Arachnological Society on 24 August 1968 when among sixty-seven species recorded the following were new: *Zelotes petrensis*, *Clubiona subtilis*, *Evarcha arcuata*, *Pardosa nigriceps*, *Antistea elegans*, *Walckenaera cuspidata*, *Entelecara acuminata*, *Pocadicnemis pumila*, *Cnephalocotes obscurus*, *Maro minutus*, *Kaestneria pullata*, *Taranucnus setosus* and *Linyphia minutus*.

In the present note 201 species are recorded; the nomenclature is in accordance with that proposed by Locket and Millidge in their third volume of *British Spiders*. Detail of distribution is not given because I think that information from random collecting may be misleading. In a large area like Bookham Common with its many types of habitat there is a constant movement of casuals from one to another and from outside, and many of the species records are based on single individuals. Only an assessment of the spiders in a detailed comparative study of several habitats over a period would give distributional data of value. Some such work has been done in a bracken area and it is to be hoped that more will be done in the future in other major habitats.

Family Amaurobiidae

Amaurobius fenestralis (Stroem), *A. similis* (Bl.), *A. ferox* (Walck.)

Family Dictynidae

Dictyna arundinacea (L.), *D. uncinata* Thor., *D. latens* (F.), *Lathys humilis* (Bl.).

Family Oonopidae

Oonops pulcher Temp.

Family Dysderidae

Dysdera erythrina (Walck.), *D. crocota* C.L.K., *Harpactes hombergi* (Scop.), *Segestria senoculata* (L.).

Family Gnaphosidae

Drassodes lapidosus (Walck.), *D. cupreus* (Bl.), *D. signifier* C.L.K., *Zelotes apricorum* L.K., *Z petrensis* (C.L.K.), *Micaria pulicaria* (Sund.), *M. subopaca* Westr.

Family Clubionidae

Clubiona corticalis (Walck.), *C. reclusa* O.P.-C., *C. stagnatilis* Kulcz., *C. pallidula* (Clk.), *C. phragmitis* C.L.K., *C. terrestris* Westr., *C. neglecta* O.P.-C., *C. lutescens* Westr., *C. compta* C.L.K., *C. brevipes* Bl., *C. diversa* O.P.-C., *C. subtilis* L.K., *Cheiracanthium erraticum* (Walck.), *Agroeca brunnea* (Bl.), *A. proxima* (O.P.-C.), *Phrurolithus festivus* (C.L.K.).

Family Zoridae

Zora spinimana (Sund.).

Family Anyphaenidae

Anyphaena accentuata (Walck.).

Family Thomisidae

Diaea dorsata (F.), *Misumena vatia* (Clk.), *Xysticus cristatus* (Clk.), *X. audax* (Schr.), *X. kochi* Thor., *X. erraticus* (Bl.), *X. lanio* C.L.K., *X. sabulosus* (Hahn), *Oxyptila trux* (Bl.), *O. atomaria* (Panz.), *Philodromus dispar* Walck., *P. aureolus* (Clk.), *P. caespiticolis* Walck., *Thanatus striatus* C.L.K., *Tibellus oblongus* (Walck.).

Family Salticidae

Salticus scenicus (Clk.), *S. cingulatus* (Panz.), *Heliophanus cupreus* (Walck.), *H. flavipes* C.L.K., *Marpissa muscosa* (Clk.), *Bianor aenescens* (Sim.), *Ballus depressus* (Walck.), *Neon reticulatus* (Bl.), *Euophrys frontalis* (Walck.), *E. aequipes* (O.P.-C.), *Sitticus pubescens* (F.), *Evarcha falcata* (Clk.), *E. arcuata* (Clk.).

Family Lycosidae

Pardosa monticola (Clk.), *P. tarsalis* (Thor.), *P. pullata* (Clk.), *P. prativaga* (L.K.), *P. amentata* (Clk.), *P. nigriceps* (Thor.), *P. lugubris* (Walck.), *P. hortensis* (C.L.K.), *Xerolycosa nemoralis* (Westr.), *Alopecosa pulverulenta* (Clk.), *A. barbipes* (Sund.), *Trochosa ruricola* (De Geer), *T. robusta* (Sim.), *T. terricola* Thor., *Pirata piraticus* (Clk.), *P. hygrophilus* Thor., *P. latitans* (Bl.).

Family Pisauridae

Pisaura mirabilis (Clk.).

Family Agelenidae

Argyroneta aquatica (Clk.), *Agelena labyrinthica* (Clk.), *Tegenaria saeva* Bl., *T. domestica* (Clk.), *T. silvestris* L.K., *Coelotes atropos* (Walck.), *C. terrestris* (Wid.), *Cicurina cicur* (F.), *Antistea elegans* (Bl.), *Hahnia montana* (Bl.).

Family Mimetidae

Ero furcata (Vill.).

Family Theridiidae

Steatoda phalerata (Panz.), *S. bipunctata* (L.), *Anelosimus vittatus* (C.L.K.), *Achaeranea lunata* (Clk.), *A. simulans* (Thor.), *Theridion sisyphium* (Clk.), *T. pictum* (Walck.), *T. varians* Hahn, *T. melanurum* Hahn, *T. tinctum* (Walck.), *T. pallens* Bl., *T. bimaculatum* (L.), *Enoplognatha ovata* (Clk.), *Robertus lividus* (Bl.).

Family Nesticidae

Nesticus cellulanus (Clk.).

Family Tetragnathidae

Tetragnatha extensa (L.), *T. montana* Sim., *T. obtusa* C.L.K., *Pachygnatha clercki* Sund., *P. degeeri* Sund., *Meta segmentata* (Clk.), *M. mengei* (Bl.), *M. merianae* (Scop.).

Family Araneidae

Araneus gibbosus (Walck.), *A. diadematus* (Clk.), *A. quadratus* Clk., *A. cornutus* Clk., *A. umbraticus* Clk., *A. redii* (Scop.), *A. triguttatus* (F.), *A. cucurbitinus* Clk., *A. inconspicuus* Sim., *Zilla diodia* (Walck.), *Singa pygmaea* (Sund.), *S. sanguinea* C.L.K., *Cercidia prominens* (Westr.), *Zygiella x-notata* (Clk.), *Z. atrica* (C.L.K.), *Mangora acalypha* (Walck.), *Cyclosa conica* (Pall.).

Family Linyphiidae

Ceratinella brevis (Wid.), *Walckenaera acuminata* Bl., *W. antica* (Wid.), *W. melanocephala* (O.P.-C.), *W. nudipalpis* (Westr.), *W. unicornis* O.P.-C., *W. cuspidata* Bl., *W. vigilax* (Bl.), *Dicymbium nigrum* (Bl.), *Entelecara acuminata* (Wid.), *Moebelia penicillata* (Westr.), *Gnathonarium dentatum* (Wid.), *Gongylidium rufipes* (Sund.), *Dismodicus bifrons* (Bl.), *Hypomma bituberculatum* (Wid.), *H. cornuta* (Bl.), *Gonatium rubens* (Bl.), *G. rubellum* (Bl.), *Maso sundevalli* (Westr.), *Peponocranium ludicum* (O.P.-C.), *Pocadicnemis pumila* (Bl.), *Oedothorax gibbosus* (Bl.), *O. tuberosus* (Bl.), *O. fuscus* (Bl.), *O. retusus* (Westr.), *Cnephalocotes obscurus* (Bl.), *Pelecopsis parallela* (Wid.), *Tiso vagans* (Bl.), *Thyreosthenius parasiticus* (Westr.), *Savignia frontata* (Bl.), *Diplocephalus cristatus* (Bl.), *Araeoncus humilis* (Bl.), *Erigone dentipalpis* (Wid.), *E. atra* (Bl.), *E. longipalpis* (Sund.), *Porrhomma pygmaeum* (Bl.), *Syedrula innotabilis* (O.P.-C.), *Agyneta subtilis* (O.P.-C.), *Meioneta rurestris* (C.L.K.), *M. saxatilis* (Bl.), *Microneta viaria* (Bl.), *Maro minutus* O.P.-C., *Centromerus sylvaticus* (Bl.), *C. dilutus* (O.P.-C.), *Centromerita concinna* (Thor.), *Macrargus rufus* (Wid.), *Kaestneria dorsalis* (Wid.), *K. pullatus* (O.P.-C.), *Diplostyla concolor* (Wid.), *Bathyphantes gracilis* (Bl.), *B. nigrinus* (Westr.), *Drapetisca socialis* (Sund.), *Tapinopa longidens* (Wid.), *Taranucnus setosus* (O.P.-C.), *Labulla thoracica* (Wid.), *Stemonyphantes lineatus* (L.), *Lepthyphantes nebulosus* (Sund.), *L. leprosus* (Ohl.), *L. minutus* (Bl.), *L. tenuis* (Bl.), *L. zimmermanni* Bertkau, *L. mengei* Kulcz., *Linyphia triangularis* (Clk.), *L. montana* (Clk.), *L. clathrata* Sund., *L. peltata* Wid., *L. pusilla* Sund.

A Note on Some Cribellate Spiders

Young *Amaurobius similis* were the first spiders to colonise the outside walls of the Research Hut, being followed by the orbweb spinner *Zygiella x-notata* and the jumping spider *Salticus scenicus*. When *Amaurobius* spins its web it lays down non-adhesive threads strung tightly across the substrate as support for strands of clinging adhesive blue meshed silk which it uses as a trap for its prey. When the adhesive threads age they lose the blue colour, bleach, dry and collapse inwards, then the spider lays down a fresh web. On this web there are caught a number of small insects which are too small for the attention of the spider. In the orbspinners such insects are chewed up by the spider when it removes its old web before spinning a fresh one. On the *Amaurobius* web these insects become the food of a small scavenging spider, *Oonops pulcher*, which is often an associate of all three *Amaurobius* species. At Bookham many oribatid mites are trapped on the web, where they are left to die, as their cuticle is too hard to be penetrated by the fangs of *Oonops pulcher*. Eventually the old webs form close sheets and where they are spun on uneven surfaces like the underside of a clod, a brick, or an old stump, the sheet does not lie close to the surface but encloses a space two or more millimetres deep, which is used as a shelter and passageway by mites, springtails and other small invertebrates. I have found that such spaces are often used as a hunting ground by false scorpions, one web sometimes sheltering as many as five individuals. Bristowe (1958) thought U. Gerhardt was incorrect in thinking that the males of *A. similis* die after mating. I have found adult males through the winter months until February, long after they had become mature.

Dictyna arundinacea, which is the most common species in the genus at Bookham, spins its webs in late April and early May on the tips of plants in open areas and places its egg-sacs behind a screen of meshed silk. The males remain on the webs in friendly relationship with the female, although under abnormal conditions, as when examining a web under the microscope, the heat of the microscope lamp will disturb the female and she becomes aggressive to her mate who flees to the extremity of the web. The production of the egg-sacs in May is dependent on the food supply and the spider will keep laying eggs while food is plentiful. At Bookham egg laying coincides with the emergence from the soil of large numbers of certain groups of flies, especially the Bibionidae, which do not fly directly into the air after leaving the pupal cases, but crawl up to the tips of plants and blunder into the *Dictyna* web. Their bodies are left attached to the web, after the spider has sucked their juices; they are otherwise undamaged and may be readily identified. After the eggs have hatched the adults leave the web, and the young, which have survived the attacks of the egg predator *Habrocytus platyphilus*, disperse, although if one opens old webs a month later they nearly always contain one to two young. In the early instars the young are hunters and not trappers of prey and operate at grass-root level. In fine seasons like that of 1970 the young spiders are nearly full grown by the late autumn, and some take to the trees, as I have beaten them from oak and hawthorn in September and October. I have not found adult males later than July.

An Aquatic Oribatid Mite

The oribatid mite *Hydrozetes lacustris* (Michael) was found in some numbers on *Lemna minor* in Sheepbell Pond in 1970 and again on a mixed *Lemna minor/Riccia fluitans* growth in South-east Pond on 28 February 1971. The genus *Hydrozetes* appears to be the only truly aquatic one in the *Oribatei*, and in America it has been reported that when abundant it has caused considerable damage to duckweed. When the ponds dry up the mites survive by passing periods of desiccation, like waterfleas and copepods, in the egg stage.

The Eriophyidae or Gall-mites

H. J. Burkill, a keen student of gall-mites in the first half of this century, wrote an account of the plant galls of the Common (Burkill 1946) in which he named twenty-five species of gall-mites, and referred to other unnamed mites. He made a number of microscope slides of gall-mite material from the London Area but because of inadequate mounting techniques these are of little value today. M. Niblett (1959) also studied these arachnids over a similar period and recorded twenty-two species from Bookham. Neither was concerned with the free-living eriophyid mites and both told me how they were handicapped by the lack of a British monograph on the group. They used the works of Houard (1908-13) and Ross-Hedicke (1927) to identify the galls.

When I began in 1968 to check on the gall-mites now present on the Common I used Buhr (1964-5) for help with the galls and I found Farkas (1965) useful for descriptions of the mites. The abbreviations HJB and MN are used when referring to Burkill and Niblett, and the B numbers refer to Buhr, whose nomenclature I have generally followed.

Subfamily *PHYTOPTINAE*

Phytoptus avellanae Nal. This mite causes "big bud" on *Corylus avellana* L., B 2031. The buds swell to a globular mass up to 10 mm diameter, the scales thickening considerably, and with several successive generations of mites very large populations build up in a few months. Sometimes *Cecidophyes vermiformis* (Nal.) is present in the galls as an inquiline.

Subfamily *ERIOPHYINAE*

Eriophyes gibbosus Nal. Nearly all green parts of *Rubus* sp. are covered with a silky felt of pointed, cylindrical whitish hairs. B 5903. Widespread on the Common but only occasionally abundant.

E. goniothorax Nal. B 2075, 2076. This mite affects the leaves of *Crataegus* in two ways. The edges of the lobes are rolled downwards and becomes yellow. The inside of the roll becomes full of short club-shaped hairs, at first white, later brown. Usually a common gall. More rarely the mite causes a violet or white patch of club-shaped hairs on the underside of the leaf.

E. piri crataegi Nal. Not uncommon on *Crataegus*. B2079. Forms numerous (often up to a 100) lenticular swellings on one or both sides of the leaf, often coalescing, with colours ranging from pale green to orange and dark brown. Galls 2 mm diameter. The "*E. pyri crataegi* (Can.)" of MN and "*E. crataegi* Can." of HJB.

E. similis prunispinosae Nal. Causes pouch galls on the leaves of *Prunus spinosa*, irregular swellings 4 x 2mm, normally close to the margin. When many are present the leaf gets very distorted. Usually abundant on the sloes in the clump. B5245. The "*E. similis*" of MN and HJB. The latter reported the gall on *P. domestica* in area 57. The mite on this latter tree is usually considered the typical form of *E. similis*.

E. sorbi (Can.). The galls are small swellings up to 5mm diameter raised on both sides of the leaf of *Sorbus*. B6747. This is the "*Eriophyes pyri* Pagnst." of HJB. It was not recorded from Bookham by MN who knew it as "*E. pyri variolatus* (Nal.)". I noted it only once.

Aceria dispar (Nal.) The mite causes the leaves of *Populus tremula* to roll up. At the same time the leaves are generally smaller than usual, the petioles are shorter and the internodes of the twig shorter. Often the galls initiate the formation of a witches'-broom. B5120. Recorded by MN only. I have found it only occasionally.

A. filiformis (Nal.) Small green to brown, irregular, roundish swellings up to 5 mm across on the upper side of *Ulmus* leaves. B7333. Recorded only by HJB, not seen by MN or the writer.

A. hippocastani (Fockeu) Causes the dense growth of long multicellular hairs in the nerve angles of the leaf of *Aesculus hippocastanum*. B194. Uncommon at Bookham and elsewhere in the London Area.

A. macrochela (Nal.) There is some controversy regarding the mite known to HJB and MN as "*Eriophyes macrochelus*". It has several forms causing different types of gall. Farkas considers them to be varieties and there does seem little difference in the structure of the different forms of the mite. Buhr considers some of the forms to merit specific rank, and I have somewhat reluctantly, in the absence of a British check-list, followed him. Causes pedunculated ball-shaped red galls in the nerve angles of *Acer campestre* leaves, on the upper side. On the underside of the leaf the opening of the gall is surrounded with multicellular hairs. B47.

A. macrorhyncha (Nal.) Causes a similar but smaller and much more numerous gall on the leaves of *Acer*. Connold (1909) estimated normal-sized leaves could hold from 600 to 1,400 galls. The opening on the underside of the leaf is surrounded by singlecelled hairs. The typical form is considered to attack *A. pseudoplatanus*, and the var. *cephalonea* (Nal.) to attack *A. campestre*. B 48, 51.

A. plicator trifolii (Nal.) Generally deforms flower-heads and rolls leaflets of *Vicia tetrasperma*. B 7549. A rare gall which MN recorded from no other location in the London Area. HJB recorded another unnamed mite associated with the galls. This may have been *Vasates retiolatus* (Nal.) which causes leaf rolling on other species of *Vicia*.

A. pseudoplatani (Corti) Causes patches of felt on the underside of the leaves of *Acer pseudoplatanus*. The hairs of the felt are white, later brown, cylindrical, with swollen tips. B 54. The record of HJB of "*Eriophyes macrochelus* var. *erinea* Trott" is probably referable to this species, which MN records. Uncommon.

A. rudis (Can.) The cause of "big bud" on *Betula*. The buds are swollen up to 10mm diameter, the leaf scales green to brown, with paler inner scales. It also causes felt patches of white to reddish club-shaped hairs on the underside of the leaf. The galls of this mite were regarded by 19th century writers on plant galls as the initiators of the witches'-brooms on birch but these are now known to be caused by the fungus *Taphrina betulina* Rostr. Buhr attributes the "big bud" galls to *A. calycophthira* (Nal.) (B 1046) and the felt galls to the typical form of *A. rudis* (B 1089), but I have followed the concensus of authoritative opinion. The var. *longisetosa* (Nal.) (B 1093) causes irregular rounded, hairy swellings on the upper surface of the leaf, between the veins, red, often coalescing, and opposite depressions with white club-shaped hairs on the other side.

A. tenuis (Nal.) This mite is usually free-living in the laminar furrows of many grasses, but frequently causes deformation of the flower head. It was first noticed at Bookham by Miss H. Franks on *Dactylis glomerata* (Burkill 1947) B 2248. I have found the mites free on *Molinia coerulea* but they did not seem to have caused any damage.

A. tetanothrix (Nal.) The small red galls from 0.5 to 2 mm high on the upper side of the leaves of *Salix* which were attributed to this mite by older writers are now believed to be caused by a complex of species. B 6099. Inquilines are often present and some species of willow may be attacked by one or other of the mites, and other willows by other mites. I have not yet analysed the species involved at Bookham but Buhr states that the galls may be caused by or be inhabited by *A. tetanothrix* and its var. *laevis* (Nal.), *A. iteina* (Nal.), *A. truncata* (Nal.) or *Vasates myrsinites* (Roiv.). A similar situation exists with the mites stated to occupy the witches'-brooms on *Salix* attributed to *Eriophyes triradiatus* Nal. by HJB and MN, which has not yet been found at Bookham.

A. ulmicola (Nal.) On *Ulmus*. B 7328. For many years I have known the elms on the Common heavily infested by this mite, being most conspicuous in Station Copse where every leaf of the trees in summer seems to be attacked. Fresh leaves which appear in August seem to be free of the mite. Other mites may be present, but are generally free-living species. The galls are 1 mm across, swellings covered with hairs, which project from both sides of the leaf. The part on the upper side of the leaf is hemispherical, pale turning brown, and the more hairy part on the underside is keg-shaped. Generally the galls are numerous and coalesce, greatly deforming the leaf.

A. varia (Nal.) B 5089. The "*E. varius* Nal." of HJB. The galls are small patches of felt of reddish club-shaped hairs on both sides of *Populus tremula*. I have seen it on Eastern Plain.

A. xylostei (Nal.) The galls are long, narrow (1-1.5 mm) grooves on the upper side of the leaf of *Lonicera periclymenum* running close to the margin. HJB wrote "Known for some years in two places in area 83. The gall was very abundant on a big bush on Bank's Common in 1943 but not so plentiful in the last two summers." MN did not record the mite from elsewhere in the London Area. In 1971 I searched several bushes in the east of the Common but failed to find the gall.

Cecidophyes atrichus (Nal.) The leaves of *Stellaria* are rolled lengthways and discoloured. B 6848. HJB found it "abundant in 1942 and 1945 on *S. graminea* L." Not uncommon.

C. galii (Karp.) On *Galium*. B 2929. HJB described its gall: "Terminal parts of plants and flowers intensely proliferated and metamorphosed, viridiscent, containing enormous numbers of *Eriophyes galii*. Very abundant in 1945". Not uncommon.

C. psilaspis (Nal.) The axillary buds of *Taxus baccata* swell to form round or oval galls up to 6 mm long. B 6968. When I was introduced to plant galls by Niblett in 1947 the first he showed me were these galls and those of the midge *Taxomyia taxi* on yew in Central Wood. They are still to be met with occasionally but generally they are uncommon in the London Area.

C. ribis (Westwood) The cause of "big bud" in *Ribes*. Reported by MN but I have seen it only in a garden just outside the survey area. B 5780.

C. vermiformis (Nal.) A vagrant species on *Corylus avellana* frequently met with in galls of *Phytoptus avellanae*. It is said to cause hairy patches on the underside of the leaves of *Carpinus betulus* but I have never seen them.

Subfamily *PHYLLOCOPTINAE*

Epitrimerus trilobus (Nal.) On *Sambucus*. Causes rolling of the leaf edges, which are yellowed. The leaves become very crinkled. B 6215. Frequent.

Phyllocoptes populi Nal. The galls are oval or round depressions up to 5 mm across on the underside of the leaves of *Populus*. Hairy. B 5086 Species of *Vasates* sp. may be present in the galls as vagrants.

Vasates anthobius (Nal.) On *Galium*. The flower heads are deformed, growing together in a mass with some rosetting of the leaves. B 2945. Not uncommon in some years.

HJB mentioned the following galls caused by unnamed eriophyid mites. On *Achillea* "Buds swollen and distorted while leaf margins were rolled upwards". Causer unknown. On *Galium* he noted "Bud galls not opening. Houard 5270". This gall has been recorded on the continent more than once but the species responsible is still unknown. B 2926. On *Pyrus malus* he found "*Eriophyes* sp. rolling up the margins of the leaves 67". This may have been caused by *Eriophyes piri marginemtorquens* Nal. B 5344. On *Salix* "A long roll on the margin of the leaf" may have been caused by one of a number of mites that attack willows. On *Ulmus* "*Eriophyes* species among white hairs on the underside of the leaves." Farkas lists fifteen species and varieties of gallmites attacking elm, the greater number being vagrant species, which occasionally induce growth of hairs or cause some damage referred to as "browning". I have found vagrant mites, frequently in numbers, in the laminar furrows of grasses, sedges and on the undersides of the leaves of *Quercus*, *Urtica* and *Taraxacum*.

I am sure that a great many more species may be recorded, especially if some concentrated effort is made to study plants not mentioned in this list. Glancing through the pages of Buhr it would seem that every common plant has its own particular gall mite.

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Report on European Conservation Year 1970

by L. M. P. Small

Early in 1969 Council decided to arrange special activities to mark European Conservation Year 1970 and Mrs Small was asked to undertake this. £200 was voted to cover the expenses. With the help of Miss Joan Small as Secretary a preliminary meeting of Sections was called and plans made for a variety of events. The Society received many congratulations on being the first to issue a complete programme booklet, which appeared shortly before Christmas.

The first meeting, arranged by the Ecology Section, was very appropriately on pollution and Mr John Gooders, Mr Jack Laundon and Dr Francis Rose gave most interesting accounts of the effects of London's cleaner air on lichens, mosses and the food of Hirundines. All are sensitive to smoke, fumes or sulphur dioxide, and the reappearance of the Hirundines nearer the heart of London suggests that the decline in smoke is having a beneficial effect.

The high-light of the whole programme was the public meeting at the Royal Institution when Mr Robert Boote, Deputy Director of the Nature Conservancy, gave a stimulating address entitled "Conservation and Man", which included references to conservation work going on all over the world. This was followed by a lively discussion, with Sir Landsborough Thomson in the chair. The film made for the Gloucestershire Naturalists' Trust "Today and Tomorrow" completed the evening. Thanks are due to the secretary and staff of the Institution, who were most kind and helpful.

Mr Pat Sellar arranged for the Society's film "London's Birds" to be shown at the New Gallery, Regent Street, and with the commentary spoken by Mr Stanley Cramp the event was assured of success. We are grateful to Mr Taylor and his staff for their co-operation.

Mr M. Wells of the South-west Middlesex Section arranged the first field meeting of the year at Bushy Park and this was open to the public. Much work went on beforehand and there was good publicity and an interesting handout for those who came. On a bright but cold day the Chairman, Mr George Parker, welcomed seventy members of the public and five parties were conducted over the planned route.

As might be expected when Miss Springett led her usual popular walk over Hampstead Heath on the following Saturday, 18 April, over sixty people came and many birds, including wheatear, redstart, goldcrest and redpoll, were seen.

The Ramblers Section arranged a visit to the area of the Lea Valley Regional Park. Seventeen people attended and were conducted to a number of points of interest by Mr Lilwall of the Lea

Valley Park Authority. A large sports and leisure centre is taking shape at Pickett's Lock and a nature trail is proposed for the Turnford area. There is a large tree nursery at Waltham Cross and it is hoped that a nature reserve and field study centre will be established at Nazeing.

The Epping Forest Field Section invited Mr Kenneth Hoy to lead a meeting in the Forest for spring migrants and the seventeen who attended saw many birds.

The President, Mr Butler, did his share by taking a party over the North Downs on 16 June to study the geology and scenery of the Chalk and Greensand.

Mr Stan Jermyn, Secretary of the Essex Naturalists' Trust, talked to the Botany Section about Essex flowers and conservation on 11 June. A large and appreciative audience had a most interesting evening and saw a beautiful film.

The Nature Conservancy invited the Society to their open day at Wye, and in June, on a fine sunny day, the Warden of Crundale Downs National Nature Reserve took a party of nearly a hundred over the area, showing the work of conservation and management in a most practical manner. The highlight was a single late spider orchid, carefully protected by a wire cage which was removed for the procession of photographers who took away a fine memento of the trip. Unfortunately this delay caused them to be caught in a very heavy shower.

Twenty people joined Mr Don Turner for a towpath walk from Kew to Kingston on 28 June. Many interesting plants were seen including some established garden escapes. The small blue clematis *Clematis viticella* and the large angelica, from which the confection is made, were both seen.

July 11-12 saw a most ambitious effort by the South-west Middlesex Section. Practically the whole membership joined in and conducted parties of the public over a previously planned route on Staines Moor. Saturday's attendance was poor but on Sunday there were over sixty participants. The weather was fine and many plants and birds were seen. The visit coincided with a massive hatch of seven-spot burnet moths. A comprehensive handout had been prepared and the whole plan was most efficient. Thanks are due to the Secretary, Miss M. Smith, and all the members who took part.

The Botanical Section meeting to Wisley was, unfortunately, poorly supported, but those who went had an enjoyable day.

The highly successful nature trail on Bookham Common in mid-July was attended by over 1,000 people; it is reported in *The London Naturalist* **50.**

On a beautiful day in September, Mr Freddie Reynolds, Conservation Officer of the Surrey Naturalists' Trust, took parties over

Thursley Common visiting different areas in the morning and afternoon. The event was well attended and so many leaders were present that visitors could choose what they would do. The party taken by Mr Reynolds devoted itself to practical conservation and management. It was indeed a privilege to have so well-informed a speaker showing what was being done or needed to be done in the field.

Dr Bruce Campbell was responsible for co-ordinating the series of lectures which began in September at the rooms of the Linnean Society in Burlington House with their help and co-operation. This course entitled "Aspects of Conservation" was attended by about fifty people. The first lecture, "The Road to 1970", was given by Dr Campbell, who traced the history of the conservation movement from its earliest beginnings to the present time. Dr Duncan Poore, Director of the Nature Conservancy, was in the Chair for a most lively discussion.

Lord Cranbrook took the Chair for the second lecture "Four-footed and Four-flippered" when Mrs Grace Hickling, one of our foremost authorities on the grey seals of the Farne Islands, talked on the difficulties and problems of their management. She also spoke about the wild Chillingham cattle, whose survival is in danger.

Dr Max Walters, co-editor of *Flora Europaea* was well qualified to speak on "Botanical Conservation". He mentioned Teesdale and showed the progress of the reservoir dam. Professor Heywood was in the chair.

The subject of the next lecture "South Wales Coast and Countryside" provided Mr John Barrett of the Pembrokeshire Countryside Unit with a challenging title. He spoke of an area where he has lived and worked for many years, with real insight into the many conservation problems. Mr Grenville Lucas, from Kew, deputised as Chairman (for Dr Prime) at very short notice.

Dr David Snow, of the Bird Room at the British Museum (Natural History), was in the Chair for the fascinating and well-illustrated talk by Mr Stanley Cramp "The Threats to Europe's Birds". He spoke of the problems confronting the ornithologists of both the Continent and our own country.

Mr Milne-Redhead, Chairman of our London Nature Conservation Committee, took the Chair for the last lecture "Beyond 1970 and the New Awareness", when Mr David Streeter wound up the series. He gave a reasoned forecast of the work which must be done by naturalists if any wild life is to continue to exist.

We are much indebted to all these distinguished naturalists who so cheerfully gave up their time to us.

On 6 September Professor Kirkaldy took a large party on a geological ramble in Hertfordshire which included the swallow holes at Water End.

The last indoor meeting of the year was the film show organized by the South-west Middlesex Section. Dr Bruce Campbell opened the programme with a brief talk on the history of conservation and introduced the films "The Private Life of the Kingfisher" and "The Wealth of the Chalk". The latter, made for the Wiltshire Naturalists' Trust, was a beautiful conclusion to a most successful evening. Over two hundred attended and as it was during the council workers' strike the Section had to do everything themselves in order that the event should not be cancelled. This included putting out and stacking away all the chairs and preparing and serving refreshments at a small reception held for the Deputy Mayor and Mayoress of Hounslow who honoured us with their presence.

At the Perivale Community Centre a joint meeting was arranged with the Selborne Society. Over a hundred people listened to a talk on "A Naturalist's London" given by Mrs Pearl Small, illustrated by slides taken by Miss Joan Small. This was followed by the film "People and Leisure".

The last event of the year was a field weekend directed by Dr Barrie Goldsmith of University College. Over thirty attended and under the guidance of Dr Goldsmith visited Hindhead, Old Winchester Hall, Kingley Vale and Butser Hill. This was a successful effort, the warden at Rogate Field Centre was most helpful, and there was general praise for the cooking and accommodation. It is hoped to repeat this venture in future years.

Although not occurring within European Conservation Year the visit of Mr Stanley Jeeves, Secretary of the Lancashire Branch of the Council for Protection of Rural England was directly connected with the programme. He spoke on "Conservation and the Photographer" and gave a detailed account of the work of his organization, illustrated by his own magnificent slides.

Our thanks are due to all who helped to make the year a success. It is impossible to mention everyone but Miss Amy Tsuji and Mr Edward Dawson who assisted the organizer and secretary at every meeting both indoors and out, dealing with tickets and publications and anything else that came to hand, certainly deserve special praise. Without them things would not have run nearly as smoothly as they did in the event.

Conservation Report 1971

by E. J. Dawson

This has been a year in which some parts of the Society's area have at last been represented on the Committee but we still need more representatives, especially in the north, and north-east and south-east of the G.L.C. area. The best news is that at last the Hertfordshire and Middlesex Trust are seeking representation on the Committee and we hope to welcome them in the New Year.

The most important area of work has been the threat of gravel extraction on Staines Moor. This is a S.S.S.I. and a metropolitan Common with public access rights, and yet for private profit the gravel interests hope to receive planning permission to destroy the whole habitat with promises of re-instatement which we know are quite impractical. We have worked closely with the Nature Conservancy and the Surrey County Council Planning Officer and we are hoping that when the Planning Committee meet in January the application will be refused. This is a good example of how naturalist and amenity bodies may well work together and we are taking part in a working party on which both are represented.

Many meetings and much talking have gone into the plans of the Metropolitan Water Board to allow some sailing on their reservoirs and although we must now pay towards the administrative costs of bird-watching permits we have been very pleased with their co-operation and hope that in due course some of the reservoirs may be declared nature reserves. Our comments and suggestions for the safety and welfare of the birds have received sympathetic consideration.

We have been approached by several bodies concerned with conservation within the G.L.C. area and although we have not necessarily been able to help we have always gone into the subject in detail. The Dulwich Society asked for help in protecting woodlands from housing development but when the area had been visited we found that there was no nature conservation case to put forward. This too was the case with the problem of Witanhurst in Highgate. It is hoped that the grounds may be added to Hampstead Heath but on consideration this too was found to be a matter of amenity alone.

We have been concerned with the incidence of Dutch elm disease but so far although we have offered help to the G.L.C. we have found no way of doing anything practical in this serious situation.

Our Bookham Common team have been much concerned with the threat to take part of the Common for the new M25 motorway and although the public enquiry was held last June we still do not know the result. This road also threatens Headley Heath and we are most concerned about it.

We have welcomed the Orpington Field Club to our Committee and through them have helped to deal with various matters including Lullingstone Castle grounds, housing plans for an area near Keston ponds and the building of a school at Crofton Heath.

The Selborne Society sought our help in preventing the careless spraying of canal banks which skirt their reserve at Perivale in Ealing and the spraying has now been taken up nationally.

At Ruxley Gravel Pit in the London Borough of Bromley, despite the efforts of Mr Frank Holroyde, dumping and other threats continue to spoil this interesting reserve of the Kent Trust for Nature Conservation.

The Colne Valley Liaison Committee, on which we are represented, continues its work to preserve at least four primary sites of importance in the proposed Colne Valley Regional Park. The Committee has now visited all these sites. It has also added its voice to the other objectors to the proposed Staines Moor gravel extractions.

Orlitts Lake, a reserve of the Berkshire, Buckinghamshire and Oxfordshire Naturalists' Trust near Iver, has been threatened by an application for water skiing but fortunately Eton Rural District Council turned this down and it is hoped that it may be possible to buy or rent the Lake as a nature reserve.

We are co-operating with the Nature Conservancy and investigating possible new S.S.S.I.s in the Greater London area. It is hoped that the provisional list will soon be ready.

We thank the four Trusts already represented on our Committee for their interest and support, and hope that Society members will report anything in their areas which may need the help of either the Committee or the Trusts.

Obituaries

JAMES FISHER, 1912-1970

James Fisher, a member of our Society for many years, died in September 1970, as the result of a car accident.

From the age of two, when his father used to catechise him on the pictures in Saunders' *Manual of British Birds*, James Fisher had an obsessional interest in all forms of wildlife, especially birds. He took a degree in zoology at Oxford, did some teaching, became assistant curator at the London Zoo under Sir Julian Huxley, and then, during the War, worked at the Edward Grey Institute at Oxford on the food and distribution of rooks, a project for the Ministry of Agriculture. Older London bird-watchers will remember taking part in the rook enquiry, master-minded by James Fisher who used the newly-formed British Trust for Ornithology as the organisational framework for one of the first attempts on the mass census of a common species.

James Fisher was very much involved, in an honorary capacity, in the early years of the British Trust for Ornithology and helped to start the Nest Record Card Scheme and the national censuses of the gannet and the fulmar. Indeed, he took a leading part in most of the many ornithological organisations to which he belonged, and the three leading societies in Britain, the British Ornithologists' Union, the Royal Society for the Protection of Birds and the British Trust for Ornithology, each gave him their highest award—a unique achievement.

In the preface to his second book, the Pelican *Watching Birds* (1940), James Fisher forecast that after the War "ordinary people . . . will get the opportunity, hitherto sought in vain, of watching wild creatures and making discoveries about them." He was, of course, completely right. Public interest in and concern for wildlife, especially birds, has expanded enormously, probably at a faster rate than in any other outdoor activity, and saturation is still not reached. James Fisher was in all senses the prophet of this expansion. He had the rare combination of meticulous scholarship and a flair for unpompous exposition; he always made you feel that he found wildlife absorbingly interesting and therefore it was reasonable that you should too. He believed that amateur bird-watchers could make and were making a significant contribution to the science of ornithology. In the thirties and forties there was at times an antipathy between scientists and bird-watchers; occasionally this could be sensed at London Natural History Society meetings and at meetings of the 1937 Bird Club, of which James Fisher was a founder member. James Fisher was in both camps and saw that any such antipathy was a waste of time: bird-watching is fun and it can also be invaluable to science. This was his message, and with skill amounting to genius he used to the full the new media of mass communication to put it over. He wrote numerous books and papers, he made over 1,000 radio and television broadcasts, he was one of the editors of Collins' "New Naturalist" series, and he took part in other publishing activities. He became famous internationally for his ability to communicate his own tremendous enthusiasm for birds and animals and his special feeling for their place in nature.

Naturally, James Fisher became an impassioned protagonist of planned conservation and he was Vice-Chairman of the Countryside Commission when he died. His last work, *Wildlife Crisis*, written in collaboration with Prince Philip, is a fitting memorial to a lifetime spent in persuading ordinary people that nature is to be enjoyed and conserved.

E. R. Parrinder

JOHN BIRKHEAD FOSTER, 1894-1970

John Birkhead Foster died on 25 May 1970. He was a keen member of the Society and held several offices over the years. He was also a regular attendant at Council meetings, of which he was an ex-officio member for some time.

John Foster was born in 1894 and was educated at Westminster School and Caius College, Cambridge, where he took an honours degree in natural science, and the Diploma of Agriculture. For thirty-five years he was an official at the headquarters of the National Farmers' Union.

He joined the Society in 1921 with interests in archaeology and ornithology. In 1927 he was appointed Syllabus Secretary and served in that capacity until 1938, when he was appointed President, a position which he retained for the period of the War. In 1958 he took over from Mr Hale as Librarian, a post he had to resign from in 1960 because of ill health. He was then elected an honorary Vice-President, in recognition of his services to the Society.

Mr Foster was interested in all branches of natural history and in his younger days contributed several papers on various subjects. During his presidential term he inaugurated a close union with the school teachers of the London County Council and was influential in the appointment of Miss H. Franks as Schools Liaison Officer. Her appointment led to many teachers becoming interested in the work of the Society.

J. B. Foster

LYDIA J. JOHNS

Miss Lydia J. Johns who died in her 79th year on 26 November 1970 had been in failing health for some time. The eldest of a family of seven, she was born at West Ham from where the family moved in 1902. Nearly all her working life was spent with one firm, Harden Brothers the tea merchants. Besides natural history her other interest was the Alexandra Choir and under Mr Proctor she sang on many public occasions at the Albert Hall.

Miss Johns joined the London Natural History Society in 1933 and like many other well-known members of that period was a good all-rounder, taking an active interest in the Archaeological, Botanical, Ornithological and Ramblers Sections. It is this last Section that owes so much to her quiet efficiency, for she held the post of Secretary of the Ramblers Section for fourteen years, and indeed, without her the Section would probably not be in existence today, for she alone held it together during the difficult war years. In addition she was a committee member of the Ramblers Section for nine years.

Living most of her life in Enfield, Johnnie loved the adjacent Hertfordshire countryside and being of a quiet and retiring disposition she enjoyed lone explorations. On these she found interesting houses, unusual plants and a great variety of birds. Above all she found ideal routes on which to lead the Ramblers, which she did frequently from 1939 for the next twenty years.

Miss Johns was a great reader and it was typical of her, that, carried away by the description of Blewbury, then a lovely village, she had immediately to plan a visit there for us.

We who knew Miss Johns appreciated the valiant work and the great amount of time she gave to the Society; it is because of her, and those officers of the past, that the Society owes its importance today.

ROSA DAVIS

MARGARET SCHOLEY

The death of Miss Margaret Scholey on 31 March 1971 was deeply felt by many older members of the Society. Her religious convictions, dry wit, and charm, seemed to belong to an earlier age, yet she was always ready to help anyone with the wisdom of her natural history background.

Miss Scholey joined the Society in 1946 and served for a number of years on the committee of the Epping Forest Field Section. She became an honorary member late in her life, which she regarded as her crowning achievement.

JULIE SMALL

Books

British Snakes. By Leonard G. Appleby. 150 + xiv pages. John Baker, London. 1971. £2.75.

The author of this book has been keenly interested in his subject for twenty-five years and his enthusiasm, together with his flair for careful natural history observation, is evident on almost every page.

After introductory chapters on identification and general biology, the greater part of the book deals with various aspects of snake behaviour; the text being admirably supported by good and rather unusual photographs, all of which seem to have been taken of captive snakes but which lose none of their value for this fact.

Mr Appleby points out that snakes are notoriously difficult to observe in the wild and that in order to study them properly it was necessary to watch them in captivity, although under fairly natural conditions wherever possible. The animals used were returned to the wild, often within a fortnight of capture. This approach resulted in vivid and informative descriptions of courtship and mating, reproduction, feeding, skin shedding and basking.

The author's snakes were obviously well cared for and repaid careful observation; however, I think that amateur herpetologists ought to be discouraged from collecting our wild reptiles, and taking them home as pets, often to be housed under unsuitable conditions so that they refuse to feed. Mr Appleby points out that snakes are declining in many areas and suffer greatly from disturbance and habitat destruction, but does not, in my opinion, make a strong enough plea for their protection from collectors.

Generally speaking the book is informative and easy to read and will be welcomed by both the beginner and the specialist. It is sometimes a little anthropomorphic in approach; for example the adder is referred to as being "supremely confident in the lethal power" of its venom (p. 21). The chapters on how the adder bites and on the effects and treatment of snake bite are especially interesting, and even here the author writes with first-hand experience.

I find both the absence of a bibliography, and the use of capital initial letters in specific names, irritating. However, I do not hesitate to recommend this useful addition to the sparse literature on British reptiles, although it is rather expensive.

P. C. Tinning

Experiments for Young Botanists. By C. T. Prime. 128 pages + 12 plates, 53 text figs. G. Bell & Sons, London. 1971. £1.40.

This is the fifth in a series of books for young experimenters, and is packed with ideas for investigations into plant nutrition, germination, transplantation, seed dispersal, breeding, etc. These are worked naturally into simple accounts of the processes which the experiments ought to demonstrate, and throw out hints for the devising of further experiments.

Few school libraries are likely to find the book expensive, but it is not easy to decide quite who it is expected will read it. There cannot be many children with the resources to buy Millon's reagent, obtain *Aponogeton* seed, or germinate coconuts in a warm greenhouse. However, not all the experiments make such demands, and any young botanist who has managed to mark with paint all the keys on my neighbour's sycamore tree will be very welcome to come into my garden to plot their subsequent dispersal! Dr Prime's book is clearly written to be read by children, but it is the biology teacher short of practical ideas who will find it most useful.

R. M. Burton

The Society's Rules

Many members will recall that the Society adopted new Rules on 2 November 1967. *At that time all members received copies. Since then a number of alterations have needed to be made and these have been approved by Special General Meetings from time to time. It has not always been possible for new members to receive up-to-date copies as a result of the alterations and it has therefore been decided to print the Rules as they stand at present.*

LONDON NATURAL HISTORY SOCIETY

RULES

NAME

1. The name of the Society shall be the LONDON NATURAL HISTORY SOCIETY.

OBJECTS

2. Its objects shall be the study of natural history, archaeology and kindred subjects especially within twenty miles of St Paul's Cathedral, the promotion of scientific investigations, nature conservation and the publication in the Society's journals of scientific and educational papers relating particularly to the Society's area.

MANAGEMENT

3. The affairs of the Society shall be managed by a Council whose members shall be the Honorary Vice-Presidents and elected officers of the Society, one representative from each Section and six other elected members. The elected officers of the Society shall be:
    a) President who shall be elected for two years
    b) Vice-Presidents who shall be nominated by Council
    c) Treasurer and Secretary who shall not be the same person
    d) Editors of the Society's journals
    e) Librarian
    f) such other officers as Council may at any time designate.

4. The Society may have a Patron if at any time Council shall so decide.

5. An Annual General Meeting of individual members of the Society shall be held in the month of December or thereabouts in every year to transact the following business:

- a) receive and if approved adopt annual reports and a statement of the accounts to the end of the last preceding financial year
- b) elect from the members of the Society the officers and members of Council, other than Section representatives
- c) elect auditors
- d) deal with any special matter which Council desires to bring before the members and to receive suggestions from members for consideration by Council.

Nominations for election shall be submitted in writing to the Secretary at least ten days before the Annual General Meeting. The date of this meeting and the last date for nominations shall be published in the Society's programme.

6. Council shall have power to:
    - a) co-opt
    - b) fill any casual vacancy which may occur in any office or its number until the next Annual General Meeting
    - c) appoint Honorary Vice-Presidents who shall be Honorary Members
    - d) appoint Honorary Members
    - e) appoint other officers, committees and working parties
    - f) regulate its own and the Society's procedure subject to these rules.

7. a) There shall be not less than four ordinary meetings of Council in any year and not more than six months shall elapse between meetings. A Special Meeting of Council shall be convened within twenty-one days upon the requisition of not less than five members of Council addressed to the Secretary and specifying the purpose for which the meeting is to be called.
    - b) A notice with the Agenda for the meeting shall be sent to each member of Council at least ten days before any ordinary or special meeting of Council is to take place.
    - c) Ten members of Council shall form a quorum.

8. Minutes shall be taken at all formal indoor meetings of the Society including its Sections.

9. a) The President shall be ex-officio member of all working parties and committees of the Society and its Sections.
    - b) The Treasurer and Secretary shall be ex-officio members of all committees of Council (but this rule shall not apply to working parties appointed by Council for a particular purpose).
    - c) The President, Treasurer and Secretary shall receive notice of meetings and copies of the minutes of (a) all Committees and working parties of Council and (b) Committees of Sections of the Society.

FINANCE

10. If the office of Treasurer shall at any time become vacant the accounts shall be audited immediately.

11. The income and property of the Society and all money received by or on behalf of the Society shall be applied solely towards the furtherance, promotion and execution of the objects of the Society and no portion thereof shall be paid by way of dividend, bonus or profit to any member of the Society, provided that nothing herein expressed or contained shall prevent the payment in good faith of remuneration or expenses or both to any member of the Society, or other person or persons for services actually rendered by him or them to the Society. All claims for expenses must be sent to the Treasurer and he may require such information in regard thereto as he may think fit. All monies payable to the Society shall be received by the Treasurer or such other officer as shall be appointed to receive same. All funds belonging to the Society shall (unless invested) be deposited in banking accounts in the name of the Society or such other names as Council may authorise and no sum shall be drawn from these accounts except by cheque signed by such person or persons as Council shall direct. Any monies not required for immediate use may be invested by Council as herein authorised. Council shall cause true accounts to be kept of the receipts, expenditure, assets, credits and liabilities of the Society and shall place before members of the Society at each Annual General Meeting a properly audited Account and Balance Sheet made up to the end of the previous financial year.

PROPERTY OF THE SOCIETY

12. The Society may receive and disclaim property of any nature whether or not it is subject to any express conditions or trusts. The Society may purchase or otherwise acquire and hold property of any nature. Any property belonging to the Society may be invested in the names of not more than four or less than two Trustees who shall be appointed from time to time by Council and any vacancy amongst such Trustees shall be filled by Council. Such property may also be invested in the name of a limited company established by and under the control of the Society for trust purposes or in the name of a nominee company or with the Official Custodian for Charities. Such investments may be in or upon such shares, stocks, funds, securities, investments and property, real or personal, freehold or leasehold, movable or immovable, in any part of the world upon such terms and conditions (if any) as Council shall in its absolute discretion think fit and in all respects as if Council were the sole beneficial

owner thereof. Council may from time to time direct the Trustees to sell, vary and transfer such investments and property. Council may deal with the said investments as if it were the sole beneficial owner thereof and without prejudice to the generality of this power may borrow for the general purposes of the Society such sums as may be required by it at such a rate of interest as may be thought fit and may charge the payment of the sum upon any property of the Society and the Trustees shall give effect to any decision of Council about a loan. If legal proceedings of any kind are resorted to or defended by the Society the Trustees shall on the instruction of Council but not otherwise prosecute or defend such proceedings either in the name of the Society or in the name of the Trustees or otherwise on behalf of the Society as may be necessary. The Trustees shall in all respects act as required by Council and a copy of a Minute of Council signed by the Chairman and Secretary of the meeting be conclusive evidence of its decision.

Any Trustee may be removed from office by a Resolution passed at a meeting of Council by a vote of not less than two-thirds majority of the members of Council present and voting at the meeting. The Trustees shall be effectually indemnified by the Society from and against any liability, costs, expenses and payments whatsoever which may properly be incurred or made by them in relation to the trusts of the property and investments of the Society or in relation to any legal proceedings or which otherwise relate directly or indirectly to the performance of the function of a Trustee of the Society.

MEMBERSHIP

13. a) Application for membership is open to all. Applicants shall become members after approval by Council and on payment of a first subscription and (if required) an entrance fee.

    b) Any person who ceases to be a member of the Society howsoever shall automatically cease to hold any office of, or to be a member of any Committee of, the Society.

14. The following are the categories of membership:

    a) ORDINARY MEMBERS

    b) JUNIOR MEMBERS—persons under the age of eighteen or if receiving full-time education under the age of twenty-five. Such members pay a subscription the amount of which shall be determined by Council from time to time.

    c) HONORARY MEMBERS—persons who have been appointed by Council under Rule 6(d). Such members do not pay an annual subscription and are entitled to all the privileges of ordinary membership.

d) LIFE MEMBERS—those who have paid a lump sum for membership under previous rules and enjoy the privileges of ordinary membership. No new life members shall be accepted.

e) FAMILY MEMBERS—members of the family of an Honorary, ordinary or life member who live at the same address may become members of the Society on payment of half the annual subscription payable by ordinary members; such family members do not receive copies of the Society's journals.

f) SUBSCRIBER MEMBERS—other natural history societies, libraries, museums, botanical gardens, schools and similar bodies which pay the same subscription as ordinary members. They are entitled to send not more than one representative to any meeting of the Society and only accredited representatives of such bodies may vote.

g) SENIOR MEMBERS—persons over the age of 65 and who have been continuous members of the Society for ten complete years shall be entitled upon application to the Treasurer to pay a reduced rate of subscription. Such members pay a subscription the amount of which shall be determined by Council from time to time. Such members are entitled to all the privileges of membership.

15. The annual subscription payable on the first day of January and entrance fee shall be an amount recommended by Council and approved by the members at a Special General Meeting or an Annual General Meeting.

16. The annual subscription of members who first join the Society on or after the first day of October in any year shall extend to the period ending on the thirty-first day of December of the following year, but such members shall be entitled to receive copies of the Society's journals relative only to the year following that in which they joined.

17. Any member whose subscription shall be in arrears for one year on the first day of January shall cease to be a member.

18. Members of the Society whose current subscription has been paid and Honorary members are entitled to:

a) receive a copy of the Society's journals and programmes as issued (except as provided under Rules 14(e) and 16)

b) attend all meetings of the Society and its Sections, to vote in person and to introduce visitors

c) have access to the Society's Library and Collections for borrowing or reference in accordance with arrangements laid down by Council.

19. Council may expel from the Society any member who refuses or fails to abide by these Rules or who is guilty of conduct which in its opinion is prejudicial to the Society. Every resolution for expulsion must appear on the agenda and must be passed by the votes of not less than two-thirds of the members of Council present. At least ten days before any such resolution is discussed the member whose conduct is in question shall be informed of the nature of the complaint and be given an opportunity of appearing before Council for the purpose of giving an explanation or denying the truth of the complaint. Every vote under this rule shall be conducted by ballot and no ballot paper shall contain any indication of the voter's name. All discussion on any resolution appearing on the agenda under this rule shall be secret and there may only be published the name of any member who is expelled hereunder.

SECTIONS

20. The Society shall be constituted in such Sections as shall be sanctioned from time to time by Council which may at any time disband a section.

21. The affairs of each section shall be managed by a Committee consisting of Chairman, Secretary (who shall not also be Chairman) and not less than three other elected members.

22. The Sectional officers and members of the Committee including the representative to Council shall be elected annually at the Section's Annual General Meeting which shall be held each year before the Annual General Meeting of the Society. The Committee shall have power to fill any vacancies and to co-opt during its term of office.

23. The Committee shall meet not less than twice in any year and not more than nine months shall elapse between meetings.

24. A report recording a Section's activities during the preceding year shall be submitted for adoption by the members at the Section's Annual General Meeting. Subject to the approval of Council this report or extracts therefrom may be published in one of the Society's journals.

25. A Section shall manage its own finances from grants made by Council. A financial statement shall be submitted for adoption by the members at the Section's Annual General Meeting and a copy sent to the Treasurer who may require it to be audited.
Sections shall observe and act in conformity with any directions published by Council from time to time. Any property acquired

by a Section shall be held on trust for the general objects of the Society. If any Section is disbanded its accounts shall be audited by the Society's auditors and all money, property, books and papers of which it had the use administered and directed by Council.

SPECIAL GENERAL MEETINGS

26. A Special General Meeting of the Society shall be convened upon the requisition of Council or of ten per cent. of the membership; such requisition shall be addressed to the Secretary, and shall specify the purpose for which the meeting is to be called. A notice shall be sent to each member of the Society at least twenty-one days before the meeting is to take place.

ALTERATION TO RULES

27. The Rules of the Society may be altered only at a Special General Meeting and at least twenty-one days' notice of any meeting to consider a proposed alteration shall be given to all members. The notice shall state the proposed change or changes. In order to effect an alteration of a rule, a majority of the members actually present and voting at the meeting shall vote in favour of the proposed change. No amendments to any proposed alteration shall be allowed.
No amendment to Rule 2 (Objects) or Rule 30 (Dissolution) shall take effect without the written consent of the Charity Commission thereto.

28. Any ambiguity or difference of opinion concerning the purport or interpretation of any Rule or any other matter not provided for in these Rules shall be referred to Council whose decision shall be final and binding.

NOTICES

29. The accidental omission to give notice of a meeting to or the non-receipt of notice of a meeting by any member shall not invalidate any proceedings or resolutions at any meeting of the Society or any Committee or Section thereof.

DISSOLUTION

30. A motion to dissolve the Society may only be made at a Special General Meeting and to effect a dissolution at least three-quarters of the members actually present and voting at the meeting shall vote in favour of the dissolution. If a motion to dissolve the Society is carried by the said majority the Society's

surplus funds, property and assets (if any) shall be disposed of for charitable purposes in connection with education and research particularly for such charitable purposes of education and research in connection with natural history as the members may at the said Special General Meeting decide to the intent that no member of the Society shall receive any of the said funds, property and assets by virtue of his membership. A statement of the reasons for advocating dissolution shall be sent to each member with the notice of the Special General Meeting.

RECORDS AND MINUTES

31. Records shall be taken and minutes kept in such forms as Council may direct of the proceedings at all General Meetings, at all meetings of Council and of every committee, sub-committee or working party of the Society and its Sections and the minutes of every such meeting shall be confirmed at and signed by the Chairman of a subsequent meeting and when so confirmed and signed shall be conclusive as to all matters and things therein recorded and purported to have been done or directed to be done. A resolution in writing signed and agreed to by all members of Council for the time being in the United Kingdom shall be as valid and effectual as if it had been passed at a meeting of Council duly called and held and may consist of several documents in the like form each signed by one or more members of Council.

Statement of Affairs

31.10.70					
			The Hindson Bequest		
14,224	8	0	Balance at 1st November 1970	14,538·49	
–	–	–	Add: Amount received in current year	11,266·09	
314	1	9	Interest on Investments	597·92	
14,538	9	9			26,402·50
			Accumulated Fund		
(75	2	9)	Balance at 1st November 1970	47·44	
122	11	7	Transfer from General Account (deficit)	172·41	
47	8	10			(124·97)
			Premises Fund		
1,965	4	9	Balance at 1st November 1970	2,122·44	
157	4	0	Add: Interest for year	170·11	
2,122	8	9			2,292·55
			Life Composition Account		
300	0	0	Balance at 1st November 1970 ...	270·00	
30	0	0	Less: Transfer to General Account ...	30·00	
270	0	0			240·00
			Library Cataloguing Fund		
200	0	0	Balance at 1st November 1970		200·00
			Ornithological Research Fund		
189	11	11	Balance at 1st November 1970	175·63	
11	0	8	Add: Interest for year	8·84	
200	12	7		184·47	
25	0	0	Less: Grant to Atlas Scheme	25·00	
175	12	7			159·47
			Other Reserves		
–	–	–	L.N. No. 49 Add. Reserve	94·95	
1,000	0	0	L.N. No. 50 Reserve	850·00	
650	0	0	L.B.R. No. 35 Reserve	650·00	
–	–	–	Programme	225·46	
–	–	–	Honoraria	100·00	
175	0	0	Plant Mapping Scheme Publication ...	200·00	
1,825	0	0			2,120·41
19,178	19	11			£31,289·96

at 31 October 1971

£	s	d		£	£
			The Hindson Bequest Investments		
10,000	0	0	Quoted Investments at cost	10,000·00	
431	16	5	Bank Deposit Account	11,966·08	
4,106	13	4	Central Investment Company	4,436·42	
14,538	9	9			26,402·50
			Current Assets		
359	0	4	Balances at Bank: Current Account ...	401·74	
1,525	12	7	Deposit Account ...	1,509·47	
2,755	17	3	Central Investment Company	2,976·25	
4,640	10	2			4,887·46
19,178	19	11			£31,289·96

Report of the Auditors to the Members of the London Natural History Society

We have verified the accounts with the books and records of the Society and certify them to be in accordance therewith.

Finsbury Circus House,
Blomfield Street,
LONDON, EC2M 7BA
1 December 1971

NORTON KEEN & CO.
Chartered Accountants

General

			Payments	
263	15	0	Hire of Halls etc.	223·35
196	1	6	Sectional Expenses including L.N.C.C.	142·97
52	16	6	Subs. to other Societies	33·75
49	13	7	Printing and Stationery	57·29
22	7	8	Library	54·79
2	15	1	Castell Research Centre	34·06
225	0	0	Honoraria	150·00
64	8	10	Postage and Telephone	85·62
28	7	6	Sundries	14·10
110	18	10	Carnegie Scheme	–
160	10	0	European Conservation Year Grant	–
–	–	–	Cost of Services (Auditors Fees, Bank Charges, Insurance)	82·86
–	–	–	Advertising Society	34·28
1,928	12	10	Grant to Publications Account	2,157·11
3,105	7	4		3,070·18
			Transfers to Reserves:	
–	–	–	Honoraria	100·00
100	0	0	Plant Mapping Scheme Research and Publication Fund	25·00
122	11	7	Excess of receipts over payments (Transferred to Accumulated Fund)	–
3,327	18	11		£3,195·18

Publications

312	14	2	Programme	192·06
–	–	–	Programme Reserve	225·46
101	17	11	London Naturalist No. 48 Excess Expenditure ...	–
–	–	–	London Naturalist No. 49 (Excess Exp. over Reserve) (£1,156—£1,000) ...	156·77
–	–	–	London Naturalist No. 49 Reserve for Excess Expend	94·95
1,000	0	0	London Naturalist No. 50 Reserve	850·00
80	2	3	London Bird Report No. 34 (Excess Exp. over Res.) (£850·76—£650) ...	200·76
650	0	0	London Bird Report Reserve No. 35	650·00
2,144	14	4		£2,370·00

Account

			Receipts		
2,472	5	8	Subscriptions— Current	2,477·76	
32	2	6	Arrears	28·50	
41	5	0	Advance	72·50	
40	15	0	Entrance Fees ...	41·80	
2,586	8	2			2,620·56
31	18	11	Donations		72·47
146	11	7	Tax Recovered from Deeds of Covenant		159·90
5	8	0	Interest on Investments		–
25	15	6	Profit from sale of securities		–
56	12	1	Deposit Acc. Int. (Nat. Westminster Bank) ...		66·09
44	1	11	Deposit Acc. (Central Inv. Co.) Ex. Premises Fund		50·28
1	11	4	Sundries including Bird Film Receipts		–
–	–	–	Refund of E.C.Y. Expenses		23·47
30	0	0	Transfer from Life Composition Account		30·00
200	0	0	Castell Research Cen. (Carnegie Sch.)		–
100	0	0	Hire of Halls Reserve		–
50	0	0	E.C.Y. Reserve		–
10	10	0	Sale of Mailing List in respect of E.C.Y.		–
39	1	5	Receipts from Film Show		–
–	–	–	Excess of payments over receipts (Transferred to Accumulated Fund)		172·41
3,327	18	11			£3,195·18

Account

156	1	6	Sale of Publications	212·89
10	0	0	Donation towards cost of London Naturalist ...	–
50	0	0	Transfer from Reserve London Naturalist Reprints	–
1,928	12	10	Transfer from General Account	2,157·11
2,144	14	4		£2,370·00

Instructions to Contributors

Submission of papers

Papers relevant to the natural history and archaeology of the London area should be submitted to the editor, Mr J. R. Laundon, Department of Botany, British Museum (Natural History), Cromwell Road, London SW7 5BD, before the end of January if they are to be considered for publication in the same year. They should be typed, with double spacing and wide (three cm) margins, on one side of the paper. Authors must retain a duplicate copy. Papers should include an abstract, summary or synopsis.

Text

Spellings are to follow *Chambers's Twentieth Century Dictionary;* locality spellings should follow the latest editions of the maps published by the Ordnance Survey. Capitalisation should be kept to a minimum. Common names of animals and plants must begin with lower-case initials, and scientific names must be underlined. Genus names should appear in full where first used within each paragraph. In descriptive matter numbers under 10 should be in words. Dates should follow the logical sequence of day, month, year (i.e. 25 December 1971). Measurements should be in metric and follow the SI system (Système International d'Unités), with imperial equivalents in parenthesis where appropriate. There should be no full point following Dr, Mr, Mrs or St. Lists should be in natural, alphabetical or numerical order.

References

Reference citation should be based on the Madison rules (in *Bull. Torrey bot. Club* **22** : 130-132 (1895) except that a colon should always precede a page number. Capitalisation in titles of papers in journals should be kept to a minimum. Journal titles should follow the abbreviations in the *World List of Scientific Periodicals* and be underlined. Examples are as follows:

In text:
Meadows (1970 : 80). (Meadows 1970).

In references:

MEADOWS, B. S. 1970. Observations on the return of fishes to a polluted tributary of the River Thames 1964-9. *Lond. Nat.* **49** : 76-81.

MELLANBY, K. 1970. *Pesticides and Pollution.* Ed. 2. Collins, London.

WHITE, K. G. 1959. Dimsdale Hall moat, part II. *Trans. a. Rep. N. Staffs. Fld Club* **92** : 39-45.

Illustrations

Distribution maps should be submitted in the form of a Recording Map with symbols in Indian ink or Letraset. Solid dots are used to indicate contemporary or recent presence, circles for old records and crosses (not pluses) for other information, such as introduced species. Tetrad dots and circles should be 4·0 mm and tetrad crosses 5·0 mm, with a line thickness of 0·8 mm; all monad symbols should be 1·6 mm with a line thickness of 0·5 mm. The legend should be written outside the frame of the map and will be set up by the printer. The Mapping Schemes Secretary can provide Recording Maps, advice and dyes for printing distribution symbols.

Line drawings should be in Indian ink on Bristol board, preferably twice the printed size. Place names, etc., must be produced with stencils or Letraset. Legends should be separate as they will be set up by the printer.

Photographs should be glossy black-and-white prints, of good contrast, preferably half-plate in size.

Proofs

Galley proofs will be sent to authors for scrutiny, but only essential corrections can be made at that stage.

Reprints

Up to twenty-five free reprints will be supplied on request. Additional copies may be purchased if ordered when the proofs are returned.

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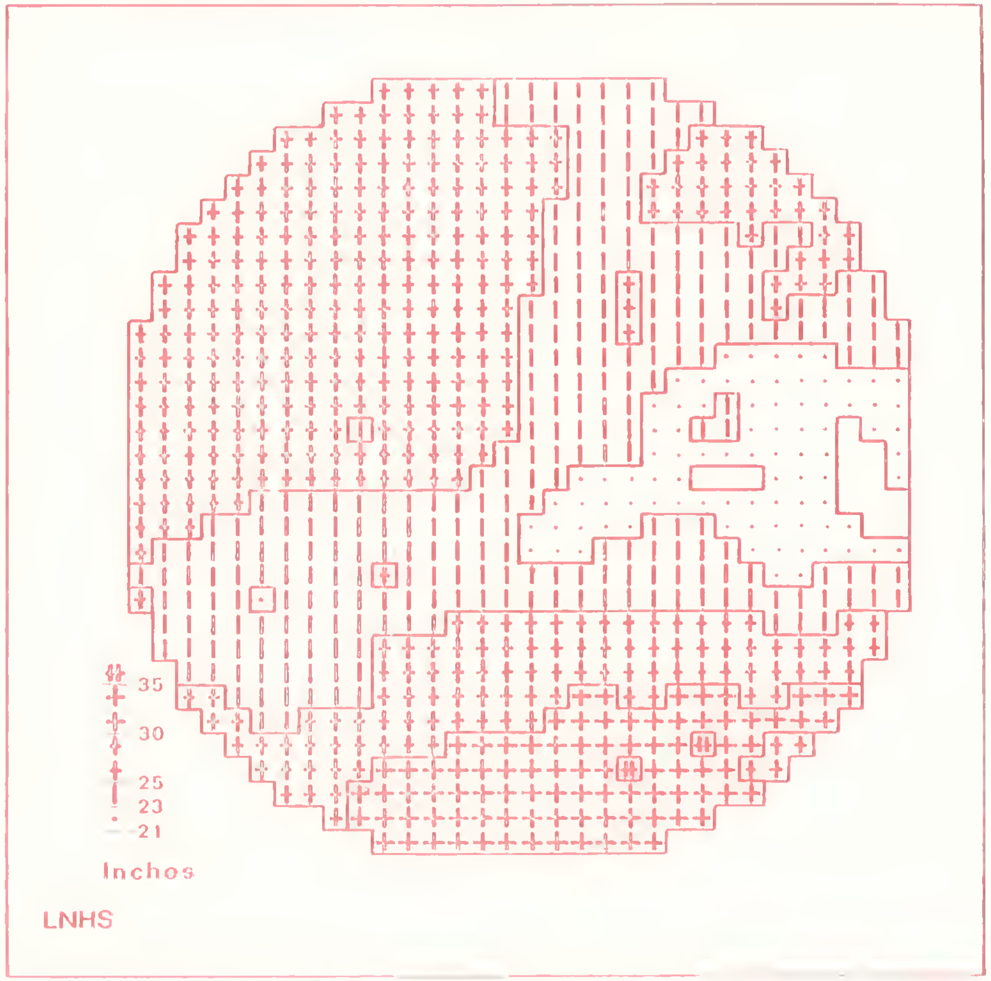

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